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**THE IMPACT OF ELECTRICITY INFRASTRUCTURE ON
RURAL DEVELOPMENT IN NIGERIA (1999-2015)**



**DOCTOR OF PHILOSOPHY
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THE IMPACT OF ELECTRICITY INFRASTRUCTURE ON RURAL DEVELOPMENT IN NIGERIA

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**A thesis submitted to the Ghazali
Graduate School of Government in fulfilment of the requirements for the
Doctor of Philosophy/Doctor of Management Universiti Utara Malaysia**



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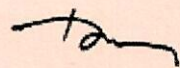
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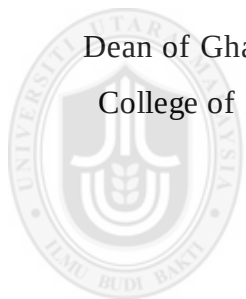


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ABSTRAK

Usaha pembangunan telah meningkatkan keprihatinan tentang kecukupan infrastruktur elektrik dalam memenuhi tuntutan industri serta pengguna individu di seluruh dunia. Walau bagaimanapun, kebanyakan kawasan luar bandar di negara membangun agak ketinggalan dalam mencapai matlamat pembangunan penting ini. Kesannya, adalah keadaan infrastruktur elektrik yang tidak mencukupi di kawasan luar bandar di Niger, Nigeria. Ini telah mendedahkan rantau ini kepada kesukaran dalam aspek bekalan kuasa, kekurangan pendapatan dan ketiadaan perkhidmatan asas sosial yang lain. Senario negatif ini menghalang Nigeria daripada bersaing secara baik dengan negara membangun yang lain, terutamanya dalam mencapai wawasan 2020 Nigeria untuk menjadi sebahagian daripada 20 kuasa besar ekonomi dunia. Kajian ini dibuat memandangkan cabaran yang timbul dan batasan dalam literatur mengenai perhubungan antara infrastruktur elektrik dan pembangunan luar bandar di negeri Niger. Kajian ini juga menggunakan kemahuan politik dan tadbir urus yang baik sebagai pembolehubah penyederhana dan pengantara masing-masing. Kajian ini menggunakan pendekatan kaedah campuran. Pendekatan kuantitatif melibatkan soal selidik terhadap 395 responden yang dipilih daripada tiga zon senator di luar bandar Niger. Aspek kualitatif pula melibatkan 9 informan yang terdiri daripada pihak berkepentingan, pegawai elektrik dan isi rumah. Penemuan kuantitatif menunjukkan terdapat hubungan yang signifikan antara infrastruktur elektrik dengan pembangunan luar bandar. Antara lapan hubungan langsung yang dikaji, lima adalah signifikan, iaitu peralihan elektrik, tadbir urus yang baik dan kemahuan politik, memberi kesan yang signifikan kepada pembangunan luar bandar. Selain itu, pengagihan dan penjanaan elektrik juga mempengaruhi tadbir urus yang baik. Bagi kesan penyederhanaan kemahuan politik, dapatan menunjukkan bahawa kemahuan politik menyederhanakan hubungan antara peralihan elektrik dan pembangunan luar bandar. Manakala, kesan pengantaraan tadbir urus yang baik hanya diwujudkan dalam hubungan antara pengagihan elektrik dan pembangunan luar bandar. Begitu juga, penemuan kualitatif menyokong penemuan bahawa infrastruktur elektrik mempengaruhi pembangunan sosio-ekonomi. Penemuan juga menunjukkan cabaran-cabaran, termasuk rasuah, pemantauan dan penilaian yang tidak betul, kekurangan keselamatan, serta cabaran dalam bekalan kuasa dan strategi yang berkesan. Justeru, kajian ini mencadangkan pembangunan institusi berkesan bagi memantau dan mengatasi masalah-masalah yang telah dikenal pasti.

Kata kunci: Penjanaan elektrik, transmisi elektrik, pengagihan elektrik, kawasan luar bandar, pembangunan

ABSTRACT

The quest for development has increased the growing concern for adequate electricity infrastructure to keep up with the emergent demands of industries and individual consumers across the globe. However, most rural regions of the developing world lag in this important developmental goal. Consequently, the state of inadequate electricity infrastructure in the rural regions of Niger State, Nigeria. This has exposed the region to untold hardship in the aspect of power supply, poor income and absence of other basic social services. This negative scenario holds Nigeria back from competing favorably with other developing countries of the world, particularly the attainment of Nigeria's perceived 2020 vision to become part of the top 20 big economies. In view of the emergent challenges and the limitations in literature on the nexus between electricity infrastructure and rural development in Niger state, this study emerged. This study also employs political will and good governance as moderating and mediating variables respectively. The study adopts a mixed methods approach. The quantitative approach involves the administration of questionnaires to 395 respondents selected across the rural areas of the three senatorial zones in Niger state. While the qualitative aspect involved nine informants comprising of political stakeholders, electricity officers and households. The quantitative findings reveal a significant relationship between electricity infrastructure and rural development. Among the eight direct relationships examined, five were significant, that is, electricity transition, good governance and political will, significantly affect rural development. Also, electricity distribution and electricity generation significantly influence good governance. For the moderating effect of political will, the finding showed that political will moderates the relationship between electricity transition and rural development. Whereas, the mediating effect of good governance was only established in the relationship between electricity distribution and rural development. Equally, the qualitative findings supported the findings that electricity infrastructure affects socio-economic development. The findings also indicated challenges that include corruption, improper monitoring and evaluation, lack of security, challenges in power supply, and effective strategy. The study, therefore, recommends the development of effective institutions to monitor and overcome the identified problems.

Keywords: Electricity generation, electricity transmission, electricity distribution, rural areas, development

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CHAPTER ONE

INTRODUCTION

1.1 Background of The Study

The pursuit of growth has heightened global worry about the state of the world's power infrastructure (Ugwoke et al., 2021; Bhutta & Omar, 2011). The electronic and Electrical Equipment (EEE) market has soared to incredible heights (Bhutta & Omar, 2011; Oyewole, 2016). Countries worldwide, including the Philippines, Germany, and Japan, are now concerned about their power sectors' ability to meet rising demands from companies and individual customers. The importance of energy infrastructure translates into growth and rivalry among the world's countries, including Nigeria (Sulyman et al., 2018a; Ameli & Kammen, 2014). Nigeria regarded the ambition to be among the top 20 largest economies by 2020 within this context. To realize this ambition, the Nigerian government views infrastructure development as critical (Sulyman et al., 2018a; Olufemi, 2015).

The development objective continues to be a priority on the global agenda and a focal point of discussion among the community of countries. At the turn of the twenty-first century, worldwide development strategies and practices shifted out of traditionalism

To modernism (Adamou et al., 2021; Castells & Halls, 2014). This move in global priorities encouraged the acceptance and adoption of the Millennium Declaration (MD) at the United Nations (UN) General Assembly in 2000, as well as the subsequent Millennium Development Goals (MDGs) And the international community's commitment to achieving eight specified developmental objectives in the year 2015 (Olufemi, 2015, Oldekop, Grugel, Roughton, Adu, 2016). The extension of the MDG agenda until 2030 demonstrates the global community's readiness to development principles. And the subsequent affirmation of a distinct Sustainable Development Goal (SDG) in the rural areas, which comprised of seventeenth targets, as well as the whole creation of Habitat III, mark a watershed moment in the universal discourse of development in towns and cities compared to rural places (Omotoso et al., 2022; Parnell, 2016). It's worth noting that governments across the world are using complex tactics to sustain current growth and advance. African governments, particularly Nigeria, have not made considerable progress toward the MDG over some decades (Parnell, 2016 & Oldekop et al., 2016).

The act of expanding or making something to be sophisticated is conceptualized as development. This also refers to the betterment of peoples, places, states, or country's current Standing concerning specific locations and time (Sulyman, 2018b; Akhtar, 2012). Development is an insatiable urge to better people's level of living (Benerra, Berik, & Floro, 2015). That resulted in the establishment of policy-making, initiatives, and projects in Human Development Reported in 2011 (UNDP, 2011) and (World Bank, 2011) both identify specific intervention programs of various sectors that would improve the global infrastructure for the rural dwellers. As noted by Chimezie (2020) and Colom (2011), the timely development of creative infrastructure and integration

of contemporary technology are critical components of every government's improvement of its working and success. As opined emphatically by Andre, Alam, Winkler, Simoes (2011), and Akande et al. (2018) critically observed that a precondition for emerging economies to achieve growth is to give affordable access to modern energy services to assist their citizens' socioeconomic development.

Globally, electricity is seen as a vital instrument for every nation's socioeconomic growth, ensuring the smooth operation of houses and companies, as well as transportation systems such as rapid trains that convey people to work, schools, and other areas of human activity. As a result, modern economies rely mainly on a reliable and cost-effective energy supply to maintain and promote economic growth and the welfare of people in rural and urban areas (Chimezie, 2020, Volk, 2013). Despite its vital role in worldwide growth, particularly in the industrial and residential sectors, electricity has been harmed by monopoly supply, which has resulted in low innovations, a lack of good service quality, and minimal competition among investors (Bhandari et al., 2020, Volk, 2013).

As is the case on other continents, demand for energy in many African countries, notably Nigeria, generally exceeds supply (Ahlborg, BoräNiger, Jagers, & Söderholm, 2015). Given Africa's immense people and material resources, governments at various levels prioritize infrastructural development as a primary priority to residents' yearnings for improved socioeconomic in their areas (Ahlborg et al., 2015). Additionally, a legion of the literature suggests that the energy supply in some African

nations, including Burundi, Cameroon, Chad, Mali, and Egypt, has been less than 50Kw per capita (Padi, Addor & Nunfam, 2015).

Over the years, the provision of infrastructure services has been perceived by researchers and policymakers as a fundamental element of economic development (Alabi et al., 2019, Calderon & Boreux, 2016). Sub-Saharan Africa has consistently been ranked at the bottommost of all developing regions in terms of infrastructure assessment and as a major impediment to growth and poverty alleviation across the region. For instance, in the strive to combat poverty and improve the living conditions of the citizens in Burkina Faso, the government, in its socio-economic development policy, identifies poor infrastructure, particularly the electricity sector, as a major obstacle to poverty alleviation (Arce et al. 2021., Peters, 2016).

Previous studies revealed that Electricity Infrastructure (EI) in Sub-Sahara Africa was identified as a major problem to the development and growth of the continent. (Cook, 2011; Kaygusuz, 2012; Lloyd-Jones & Rakodi, 2014). On this premise, a study recommends continual support for infrastructure essential for growth and sustainable development (Ogunjobi et al., 2021, Abdul-Salam & Phimister, 2016). Infrastructure expedites and justifies economic growth; by improving rudimentary services to the poor, such as accessibility to electricity, portable and drinkable water, and good road networks to connect the rural and urban areas. As a result, most of the developing countries within the African continent, Nigeria in particular, have embraced the idea

of providing infrastructure to their citizen to complement public investment in social services (Fualal & Ehrenkranz, 2016; Jacobs, 2016; Somma & Rubino, 2016).

The stability of the power supply generated by any country is the hallmark of a developed economy and a prime indicator to determine the economic growth of any country or otherwise. (Alley& Alley, 2016; Jacobs, 2016). Against this background, the modern economy does not compromise with its electricity industry because power is the primary source of wealth creation. Corroborating this assumption and UN policies, the 1999 Constitution of the Federal Republic of Nigeria made a provision for Fundamental Objectives and Directive Principles of State Policy under its second chapter, which directs the government to provide basic needs to the citizen on political, social, and economic requirements which in its entirety captures infrastructural facilities (Chimezie, 2020, and Okeke, 2011).

Electricity generation (EG) began in Nigeria in 1896, fifteen years after it was introduced in England. The Nigeria Electricity Supply Company (NESCO) began operations as an electric utility company in 1929 with the construction of the country's first hydroelectric power station at Kurra in Jos, plateau state. Even though electricity power has existed for a longer Length of time, fewer than 45 per cent of Nigerians benefit from its services (Sulyman, 2018a, and Ekeh, 2012).

Rural Development (RD) policy is critical for rural transformation. United Nations (UN) Development Project, 2015 considered Rural Development a shared

responsibility among sectors such as private, public, and non-profit. Also, it cannot rely solely on a flood of cash aid from global organizations (Akade et al., 2018; Akpan, 2015). The concept of inclusive Rural Development (RD) is especially critical for developing nations with limited people and physical capital. Okon (2016) asserts that RD has a critical duty for a state or a region, and non-governmental organizations (NGOs) aim to provide rural residents with infrastructure such as roads, improved education, and power, among other things. Industrialized and industrializing countries rely on a neoliberal model in which rural growth is lured from the outside via a 'trickle-down' technique facilitated by increased rural output and investment.

The Nigerian government has dedicated enormous resources to RD. Yet, these resources do not reflect economic reality since most Nigerians living in rural regions lack access to basic infrastructure (Chinn et al., 2014; Strasser et al., 2016; Tanzi, 2016). The bad execution of rural programs and projects was due to a weak political will. As a result, infrastructurally, it has been shifted to urban regions, compounding rural poverty and facilitating the movement of Younger and able laborers to urban areas (Ugwoke et al., 2021, Kaygusuz, 2012; Olaseni & Alade, 2012).

Various policies guide the construction of the developmental plan in the State to ensure compliance with worldwide practices as well, as power infrastructure is part of them. Therefore, apart from the federal government policy on power, there was no other one in the state because this policy remains in federal government-exclusive duty. States have just started investing in energy to meet the population's demand, but this remains

insufficient and inconsistent plans towards its accomplishment. Also, there is a need for a specific period and programs that shall not be addressed differently. For example, a sector uses 2011 as its baseline while another uses 2015, all in the same plan when estimates are treated identically but for different years. There is a need for more effective engagement with the Bureau of Statistics.

There is also less information presented on key performances of sectors (Niger Vision; 3:20; 20). By and large, Political Will (PW) is generally perceived as an imperative yet significantly under-investigated. This is a variable that needs theoretical clarity and substantial explanation. Despite improvement in establishing political skills as a critical resource for guidance in the organization, political will has not received much attention because it reflects more as an abstract concept. News, reports, and national and international discourse attributed the absence of political will to address starvation, disease, and scarcity of infrastructure. Thus, our inability to understand an individual's level of politics will keep us away from sustainable change in our society (Ogunjobi et al., 2021, Kapoutsis, Papalexandris, Treadway, & Bentley, 2015).

1.2 Problem Statement

In recent years, the electricity supply has become significant due to its indispensable role in every facet of human endeavor. Electricity services have become a parameter by which the standard of living and the level of industrialization of nations is measured. The absence of electricity exposes people to untold hardship, causes discomfort, and hampers competition and productivity vis-a-vis poor income and

poor essential social services in most developing countries where Nigeria and particularly Niger state belongs (Alley & Alley, 2016; Jacobs, 2016, Ahemen, Amah, & Agada, 2016; Umoren & Udoudoh, 2017; Johnson & Masias, 2017).

Nigeria is endowed with natural and non-renewable energy resources like Petroleum, natural gas, and uranium. Similarly, it has renewable power resources, including geothermal and solar energy. Nevertheless, power supply in rural and urban areas has not reflected Nigeria's numerous endowed resources as the host country (Akuru, Onukwube, Okoro & Obe, 2017; Giwa, Alabi, Yusuf and Olukan, 2017, Tsivor, 2014).

Table 1.1 exhibits a list of power stations in Nigeria.

Table 1.1

Power stations in Nigeria

Serial Number	Hydroelectric Stations	Capacity (Megawatts)	Status	Ownership
1	Kainji Power Station	800	Functional	Public
2	Jebba Power Station	540	Functional	Public
3	Shiroro Power Station	600	Functional	Public
4	Zamfara Power Station	100	Functional	Public
5	AES Barge	270	Non-operational	Public, private Partnership
6	Aba Power Station (IPP)	140	Partial operational	Public private Partnership
7	Afam IV-V Power Station	726	Non-operational	Public private Partnership
8	Afam VI Power Station	624	Partially operational	Public private Partnership
9	Alaoji Power Station	107	Partially operational	Public private Partnership
10	Calabar Power Station	561	Non-operational	Public private Partnership
11	Egbema Power Station	338	Non-operational	Public private Partnership
12	Egbin Thermal Power Station	132	Partially operational	Public, private Partnership

Serial Number	Hydroelectric Stations	Capacity (Megawatts)	Status	Ownership
	(FGN but Privatized)			
13	Geregu I Power Station- Privatized	414	Partially operational	Public, private Partnership
14	Geregu II Power Station	434	Partially operational	Public-private Partnership
15	Ibom Power Station	190	Partially operational	Public private Partnership
16	Ihovbor Power Station	450	Partially operational	Public private Partnership
17	Okpai Power Station	480	Operational	Public private Partnership
18	Olorunsogo Power Station	336	Partially operational	Public private Partnership
19	Olorunsogo II Power Station	675	Partially operational	Public private Partnership
20	Omoku Power Station	150 .	operational	Public private Partnership
21	Omotosho I Power Station (FGN- Privatized)	336	Partially operational	Public private Partnership
22	Omotosho II Power Station	450	Partially operational	Public private Partnership
23	Sapele Power Station- Privatized	1020	Partially operational	Public private Partnership
24	Sapele Power Station(NIPP)	450	Partially operational	Public private Partnership
25	Transcorp Ughelli	900	Operational	Public private Partnership
26	Ibom Power Plant	191	Operational Since	Public private Partnership

Source: Presidential Task Force on Power, (2015)

Note: S/NO refers to serial numbers

Despite these numerous power stations, statistics show that in 2014, about 46 per cent of energy was lost due to technical and commercial problems and collection losses (Aliyu, Ramli, & Saleh, 2013). Similarly, the Transmission Company of Nigeria TCN (2017) reveals that Electricity Generation (EG) in Nigeria over the years has been fluctuating. For instance, it increased from 3,810 to 4,285 in 2016 and subsequently

declined from 3,959 to 2,662 in January 2017, respectively (Maja, 2014). Table 1.2 below explains the electricity capacity installed and capacity generated from 1999 to 2014.

Table 1.2

Electricity capacity installed and capacity generated from 1999 to 2014

Serial Number	Year	Capacity Installed	Capacity Generated
1	1999	5,906 Megawatt	1,750 Megawatt
2	2013	6,953 Megawatt	3,800 Megawatt
3	2014	7,445 Megawatt	3,900 Megawatt

Source: Presidential Task Force on Power (2015).

Numerous nations, including Malaysia in Asia, Africa, Ghana, and South Africa (Hannan et al., 2017). The United States has conquered the obstacle among nations with similar challenges, while Nigeria continues to loom in black darkness (Olaoye et al., 2016; Adenikinju, 2003). This problem has impacted industrial productivity (Milewski & Budzianowski, 2014), which has also contributed to the proliferation of rural-urban migration and a low standard of living. (Olaoye, et al., 2016). (MacKay, 2008; Olaoye, 2016). Table 1.3 illustrates the incidence of substandard power in Nigeria throughout the time under examination.

Table 1.3

Comparison of electricity generation and accessibility in four countries

Serial Number	Country	Population	Power generation	Percentage of citizen access to electricity
1	Nigeria	180 million	3,900 Megawatts	48
2	South/ Africa	53 million	44,175 Megawatts	85
3	Ghana	28 million	12,963 Megawatts	78.3
4	Malaysia	30 million	20,944 Megawatts	98

Sources: Transmission Company of Nigeria, 2017. Energy Commission, Ghana, 2015. World Bank, 2014

The above are major power stations in Nigeria that have supplied electricity to the country and some neighboring countries like Ghana for barely a decade. Other minor stations are shown below.

A cursory look at Table 1.1 indicates that most power stations are not functioning. Accordingly, Ekeh (2015). Reveals that inadequate and unreliable electricity is a threat to Nigerian citizens' social and economic life (Kemausuor & Ackom, 2017) as it has dissuaded investors, entrepreneurs, and managers in their respective transactions (Ozoegwu, Eze, Onwosi, Mgbemene & Ozor, 2017). A recent study shows that the circumstances of poor electricity services and their likely sources have been identified, but how large the extent of these losses and where they come from remain unknown and unattended (Abdulkareem, 2016). The electricity problem affects both the public and private sectors in Nigeria. However, the challenges are more severe in rural areas as a result of the ever-increasing demand-supply gap and poor Electricity Transmission (ET) and Electricity distribution (ED) hitches, as illustrated in Tables 1.4 and 1.5 below (Statistic, 2014). For instance, an estimated 400 industrial establishments in the Kano state of Nigeria were forced to close down and over 500,000 workers were retrenched due to lack of power (Chimezie, 2020 and Sambo et al. 2012).

. Table 1.4

Percentage of electricity distribution by type of electricity supply in Nigeria 2010

State	PHCN (NEPA)	Rural Electrification*	Private Generator	PHCNGene rator	Rural Electricity/ Generator	Solar Panel
Abia	89.6	0.9	0.5	5.0	4.1	0.0
Adamawa	89.5	2.9	1.9	4.8	1.0	0.0
Akwa	82.8	0.4	2.9	13.1	0.8	0.0
Anambra	81.0	1.7	1.0	15.6	0.7	0.0
Bauchi	77.5	8.0	1.4	9.4	3.6	0.0

State	PHCN (NEPA)	Rural Electrification*	Private Generator	PHCNGene rator	Rural Electricity/ Generator	Solar Panel
Bayelsa	33.1	36.1	2.3	2.3	26.3	0.0
Benue	68.5	14.4	2.7	10.8	3.6	0.0
Borno	87.9	6.1	0.0	6.1	0.0	0.0
Cross	91.7	6.2	0.5	1.6	0.0	0.0
Delta	93.6	2.7	1.5	1.5	0.8	0.0
Ebonyi	78.9	12.7	0.0	1.4	7.0	0.0
Edo	93.1	2.1	1.2	2.7	0.9	0.0
Ekiti	91.1	1.0	0.8	6.9	0.3	0.0
Enugu	75.0	16.9	1.3	5.9	0.8	0.0
Gombe	94.7	3.2	0.0	2.1	0.0	0.0
Imo	85.4	5.0	2.1	7.5	0.0	0.0
Jigawa	93.2	0.9	0.0	4.3	0.9	0.9
Kaduna	84.8	5.1	2.0	7.6	0.5	0.0
Kano	87.0	6.0	0.0	4.0	3.0	0.0
Katsina	80.4	14.7	0.0	4.3	0.0	0.6
Kebbi	86.4	1.6	3.8	7.1	1.1	0.0
Kogi	79.2	3.3	0.4	15.8	1.3	0.0
Kwara	92.8	1.8	0.3	2.4	2.7	0.0
Lagos	67.9	1.2	1.2	25.9	3.5	0.2
Nasarawa	76.0	0.6	7.2	13.2	3.0	0.0
Niger	75.2	1.8	0.9	21.7	0.0	0.4
Ogun	94.5	0.3	0.0	5.2	0.0	0.0
Ondo	87.5	0.8	2.9	2.9	5.8	0.0
Osun	90.5	0.0	0.4	7.1	2.0	0.0
Oyo	97.7	0.9	0.5	0.9	0.0	0.0
Plateau	92.5	1.3	1.3	3.8	1.3	0.0
Rivers	66.0	26.3	6.7	1.0	0.0	0.0
Sokoto	90.4	6.6	0.6	1.8	0.6	0.0
Taraba	85.7	0.0	0.0	14.3	0.0	0.0
Yobe	77.0	6.9	1.1	11.5	3.4	0.0
Zamfara	87.0	6.9	0.0	3.8	1.5	0.8
FCT	67.4	0.9	1.9	27.6	2.2	0.0
Rural	81.5	7.5	2.0	6.2	2.6	0.1
National	82.2	5.5	1.5	8.4	2.4	0.1

Source: National Bureau of Statistics, (2014)

PHCN means Power Holdings Company of Nigeria. Note: The above statistics of electricity supply are subsidiaries or mini-grid or "micro grid or isolated grid" enjoyed in Nigeria. They are sets of electricity generators and power storage systems interconnected to the main distribution network that supplies electricity to a limited area for customers. They occupy small-scale electricity generation like 10 kW to 10MW, which provides few consumers through a distribution grid that can function independently from the national grid.

A comparative study juxtaposes the progress of the electricity supply of four rural communities in Romania using employment, demographics, income, and processed agricultural land from 2010 to 2014, emphasizing the communities with electricity and those without electricity (Cebotari, 2017). The result shows no significant difference between rural areas and those without implemented electricity projects because the rural electrification project was deployed by private investors and registered in metropolitan areas only. On the other hand, Cook (2013) argues that rural electrification has a significant relationship with development, poverty alleviation, and improved standard of living (Cook, 2013). Yet, rural electrification remains challenging in developing countries (Feldman, 2017). According to (Azimoh, Klintonberg, Mbohwa & Wallin, 2017), the appraisal of off-grid electrification programs in rural areas of India shows they mainly rely on mini-grid and solar home systems (SHS) for all economic activities (Bhattacharyya & GaNigeruly, 2017; Bhattacharyya & GaNigeruly, 2017; Pereira, Sena, Freitas & Da Silva, 2011).

Table 1.5
Percentage of Household electrification beneficiaries across Nigeria 2010

State of Residence	Have Electricity	No Electricity
North Central	48.7	51.2
FCT-Abuja	77.7	22.0
Benue	22.1	77.9
Kogi	62.9	37.1
Kwara	90.6	9.1
Nasarawa	33.2	66.5
Niger	51.7	48.2
Plateau	36.3	63.7
North East	29.3	70.4
Adamawa	37.6	62.2
Bauchi	29.3	70.3
Borno	33.0	66.5
Gombe	48.1	51.8

State of Residence	Have Electricity	No Electricity
Taraba	10.9	88.8
Yobe	18.1	81.7
North West	42.2	57.7
Jigawa	26.0	74.0
Kaduna	53.5	46.2
Kano	52.1	47.9
Katsina	31.3	68.5
Kebbi	44.4	55.6
Sokoto	38.9	60.9
Zamfara	29.1	70.6
South East	66.4	33.6
Abia	81.7	18.3
Anambra	88.1	11.8
Ebonyi	39.2	60.7
Enugu	55.4	44.6
Imo	69.9	30.1
South South	68.3	31.3
Akwa Ibom	68.0	31.8
Bayelsa	52.5	47.3
Cross River	57.4	41.4
Delta	78.3	21.6
Edo	82.4	17.5
Rivers	65.1	34.5
South West	81.1	18.8
Ekiti	92.7	7.3
Lagos	99.3	0.5
Ogun	72.0	27.9
Ondo	66.3	33.7
Osun	89.4	10.6
Oyo	66.6	33.3
Total	55.6	44.2

Source: National Bureau of Statistics (2014)

Note: The above data illustrates the percentage of households from each of the six geo-political regions in the 36 states and federal capital territory Abuja who have access to electricity supply and those who do not have access to electricity. The statistic captures off-grid renewable energy, respectively

Consequently, on the return of political power from the military to civilian administration, the political campaign slogan was on rural infrastructure development through the construction of road networks, health facilities, agriculture, and particularly provision of electricity services (Ahemen, Amah & Agada, 2016; Trotter, 2016). A study indicates that democracy across the globe is strongly connected to rural and urban electrification (Bates, Fayad & Hoeffler, 2012; Trotter, 2016). To this end, the Nigerian government allocated significant resources to the electricity sector. For instance, statistics show that twelve-billion-dollar equivalent to one trillion, four hundred billion Naira from 1999 to 2007 were committed to the electricity supply (Isaiah, 2015). In other versions, the Federal Government of Nigeria FGN invested two trillion and seventy-four billion Naira in the country's energy sector for the past sixteen years of its civilian administration between 1999 – 2015 (Umoru, 2015).

Nigeria generates the wholesale of its hydroelectricity from three great hydropower plants located in Kainji, Jebba, and Shiroro, all in Niger (Ohimain, 2015). According to Igali (2014), the Nigerian power sector has recorded significant achievements in stable service delivery and market structure. Thus, the country is poised to meet its power demands (Nwankwo & Njogo, 2013) and contribute positively to economic development (Nwankwo & Njogo, 2013). A recent study reveals that the impact of electricity service on the predominantly Nigerians, particularly Over 80 percent of the main energy consumption for both rural and urban centers in Nigeria is met by petroleum (Akorede, Ibrahim, Amuda, Otuoze & Olufeagba, 2017). This justifies

Nigeria's inadequacy of national grid power generation (Abila, 2014; Ozoegwu, Mgbemene & Ozor, 2017).

In its vision to utilize the advantage of the domiciled hydropower plants and commitment toward infrastructural development, mainly rural electrification projects, the Niger State government followed suit. Hence, amended its edict and upgraded the Ministry of work and infrastructure by assigning additional responsibilities vis-à-vis channeled significant resources to reform and expand the Rural Electricity Board (REB) operation territory. (Niger State Government, 2011). Consequently, REB was rechristened as Niger State Electricity Board (NSEB) and was authorized to offer services to rural and urban communities to bridge the electricity gap (Niger State Government, 2011). Similarly, the Federal Government awarded 19 contracts for the extension of electricity and installation of transformers in some selected communities in Niger State Rural Electrification Authority, (2015) NSREA. The efficacy of this board in actualizing the dream of “electricity for all” in rural areas to improve their living standard remains a topic of debate among public analysts (Alley, Egbetunde & Oligbi, 2016; Lionel, 2013; Onochie, Egware & Eyakwarnor, 2015).

Essential to note here is that. This worst scenario persisted and led to about one million citizens of Minna, the headquarters of Niger State, publicly protesting and storming the area office of the Abuja Electricity Development Company (AEDC). And the state House of Assembly over incessant power outages in the state for the past two years, even though the state is the host and custodian of the three major hydropower in the

country (Dipo, 2016). Poor utilization of budgetary allocation, corruption, insufficient power generation as a result of an attack on electrical installations and, above all, absence of political will are among the major factors that contributed to the power failure in Nigeria (Amakom, 2012; Emodi & Yusuf, 2015). Amakom (2012). Further argues that a persistent increase in the budgetary allocation to the power sector without a corresponding increase in power generation explains the high level of the absence of political will and good governance, which can affect the development of Nigeria, in particular. Below is a fourteen years budgetary allocation to the power sector under a bad government in Nigeria.

Table 1.6

Budgetary allocation to the power sector from 1999 to 2012

Years	Federal Expenditure(₦Billion)	Power Sector total spending (₦Billion)	Power Sector Capital Spending(₦Billion)
1999	315.22	6.96	5.50
2000	537.57	31.97	29.54
2001	851.75	80.41	78.40
2002	840.85	69.96	63.44
2003	765.13	46.68	40.59
2004	918.30	58.94	54.62
2005	1,617.63	93.29	91.11
2006	1,876.30	75.85	73.51
2007	2,266.39	104.65	100.78
2008	2,492.08	139.78	114.38
2009	2,870.51	93.44	88.47
2010	4,608.62	194.52	189.78
2011	4,226.19	90.03	86.25

Source: Federal Ministry of Finance & Central Bank of Nigeria (CBN) 2012; Amakom, (2012) The table shows the trend of persistent increase in the capital expenditure to the power sector without a corresponding increase in power generation in Nigeria.

This study would be more analytical and more focused if there were National policies on EI that would enable us to uncover whether or not they were implemented. If so, were they in line with the guiding principles? And if not, strategic plans should be put in place and adequately monitored so that Niger and Nigeria's energy sectors would be sustainable. Niger State introduced a rural electrification program called to enhance the standard of life of people in rural areas called “light for all” this program is yet to accomplish the purpose for which it was established. The researcher has put up some impressive questionnaires and interview questions to help explore some of the problems in detail.

Rural Development in Nigeria contradicts the economic prosperity generated from the country's oil wealth as evidenced by the challenges of accessibility of the major needs of life, including food, provision of houses, formal education, hospital, electricity, etcetera (Chimezie, 2020, Aboyin 2011). In the same vein, Paul (2014). argues that multiple development plans, institutional inconsistencies, and discontinuity of policy and programs have been adduced as illuminating reasons that impede development efforts in Nigeria's rural areas despite enormous resources invested. Ibrahim (2014) contends that poor infrastructure in rural areas explains the massive rural-urban migration, which raises the pressure to provide additional socio-economic infrastructure in urban areas.

In preceding studies, scholars perceived political will (PW) as a missing link to achieving sufficient and stable electricity in Nigeria (Akande et al., 2018, Chineke,

2012). Transparent political determination and good governance (GG) are perceived as driving forces for electric power reform in Nigeria (Alabi et al., 2019, Chineke & Ezike, 2010). In the same vein, Ogbeidi (2012). stressed the need for an attitudinal change in Nigerian political leaders to exhibit political will toward actualizing state policies. Similar studies only emphasize electricity and RD (Arce et al., 2021, Omotoso et al 2022, Cabraal, Barnes & Agarwal, 2005; Chambers, 2014; Das, 2008; Goetz & Gupta, 1996; Shaaban & Petinrin, 2014). However, the literature reviewed so far has not shown any study that evaluated the impact of Electricity Infrastructure (EI) using Political Will (PW) and Good Governance (GG) as moderating and mediating variables, yet, the findings on the impact of power supply in RD remain contradictory. While some reveal that the EI is significant to RD, others refuted it (Aliyu, Dada, & Adam, 2015; Alstone, Gershenson, & Kammen, 2015; Baiyegunhi & Hassan, 2014; Dada, 2014a; Mohammed, Mustafa, Bashir, & Mokhtar, 2013; Oyedepo, Fagbenle, Adefila, & Adavbiele, 2014). This necessitates the introduction of political will and good governance as moderating and mediating variables, respectively (Baron & Kenny, 1986), to examine the effects of hydropower in RD of the state.

A study on the national electricity conducted shows that the mainstream of the southern regions of Nigeria was connected to the national grid to the detriment of the northern regions that are the host of hydro power, as indicated in the underneath.

Table 1.7

Percentage of household beneficiaries of electricity in six geopolitical zones

Geo-political regions	Percentage of household beneficiaries of electricity
South-East	66.4
South-South	68.3
South-West	81.1
North-East	29.3
North-West	42.2
North-Central	48.0

Source: National Bureau of Statistics (NBS) (2014)

Table 1.7 above explains the percentage of household beneficiaries of electricity across the six (6) of Nigeria's geo-political areas, with the region of the South-West benefitting higher electricity services at 81.1 per cent and the lowest household beneficiaries being the Northeast region at 29.3 per cent. While the North Central, the major power producer, benefited 48 percent of the EI, the south and southeast enjoyed 68.3 percent and 66.4 percent, respectively. Contrary to the above, an independent study conducted by Usman et al. (2014) reveals that the South-East was benefitting 60 percent, the south-south 61.2 percent, and the southwest 78.1 percent, respectively.

An independent study on the power supply was only concerned with the statistics of consumers in some parts of Nigeria, such as the South-South, South-West, South-East, and North-East geo-political zones, respectively (Sulyman2018a, Sulyman2018b and Usman et al. 2014). The study was silent on the potential impact of electricity on the citizens. Again, the study ignored the North-West and North-Central zones on the subject matter, which establishes a reliable gap for the researcher to further study the interconnections between the energy and RD, particularly in the state rural areas.

According to Creswell (2012), a phenomenon should be studied if it is broader than the previous one or examine the topic more systematically, methodologically, or comprehensively. Therefore, this study intends explicitly to determine how huge resources expended on electricity infrastructure have impacted the development of rural areas in Niger State.

1.3 Research Questions

The study evaluates the impact of Electricity infrastructure on the development of rural areas of Niger State and the extent to which political will and good governance would improve the development of rural areas. ~~Within the context of mixed methods, the research questions adopted a sequential approach to Understanding the quantitative data in detail using follow up qualitative data (Creswell, 2013).~~ The following questions are guides below.

- i. To what extent does Electricity Infrastructure influence Rural Development in Niger State?
- ii. Does political will moderate the relationship between Electricity Infrastructure and Rural Development in Niger State rural areas?
- iii. Does good governance as an intervening variable mediate the relationship between Electricity Infrastructure and Rural Development in Niger State
- iv. What are the challenges of electricity in the rural areas of Niger State?
- v. What are the strategies required to improve electricity in the rural areas of Niger?

1.4 Research Objectives

This study generally evaluates the effects of electricity infrastructure on Niger State rural areas' development. Precisely, the study aimed to achieve the following objectives:

- i. To determine the relationship between electricity infrastructure and rural development in Niger State.
- ii. To assess the political will as a moderating effect on the relationship between Electricity Infrastructure and Rural Development in Niger
- iii. To assess the role of good governance as an intervening variable in the relationship between Electricity Infrastructure and Rural Development in Niger.
- iv. To identify the challenges of electricity distribution in the rural areas of Niger
- v. To explore the strategies for improving electricity supply in the rural areas of the State.

Objective one of the studies tends to evaluate the impact of electricity infrastructural development from a broader perspective, looking inwardly at how the infrastructure has contributed to income generation, the rural dwellers' health, improved living standard and general social welfare services. Objective two intends to investigate the moderating effects of political will on EI and RD. In contrast, objectives three and four, on the other hand, will explore the challenges of EI and strategies to improve it.

1.5 Scope of the Study

The study is limited to the rural areas of Niger State and examined the impacts of electricity infrastructure in relation to the development of those areas and the moderating and mediating effects of political will and good governance for rural people empowerment and development. This is imperative to justify the purpose of selecting the periods of this study. Literature reveals that 1999 marks the end of military rule and the handing over power to a civil democratically elected government in Nigeria. The 2015 presidential election witnessed the ruling political party losing out to the opposition after sixteen (16) years of reign. The then ruling party capitalized on the advantages of her Strength and population to ignore their primary governance responsibilities, and greed for power made them undermine section fourteen (14) in the 1999 Constitution of the Federal Republic of Nigeria. The section allows for zoning formula/power shift among the country's six (6) geopolitical zones, thus: Southern-Western part, Southern Eastern, South-Southern, Northern-Eastern part, Northern Western part, and Northern Central part. This arrangement aimed to enable the political representation and participation of all (inclusive governance). This would strengthen the Nigeria Federal arrangement because of the malty religion and ethnic diversity of the Nigeria State. (Ugwoke et, al 2021, Awodepeju, Adelusi & Oluwashakin, 2012; Agbakoba, 2011).

Respondents involve the stakeholders of the Ministry of Works and Infrastructure and the beneficiaries of electricity infrastructure in the rural areas of Niger State. About 80 percent of the population depends directly on agriculture as a source of earnings and survival. However, 35 percent of the able body have migrated to the urban center to

secure a job due to poor electricity infrastructure to engage their services in the rural areas. Rural-to-urban migration has recently reduced the population in rural areas, which consequently declines farming activities and leads to food insecurity, overcrowding, and challenges to social amenities. The study shall be restricted to a mixed-method approach to generate data from the beneficiaries of electricity in the state rural areas, stakeholders in the Ministry of Works and Infrastructure, and the representatives of the agencies meant for generating and distributing the electricity.

The period (1999-2015) marked the beginning of the campaign mantra “Light for all”, aimed at reducing rural-urban movement and alleviating poverty (Niger State Government, 2007). To elicit relevant information about the study area, the researcher shall consult stakeholders from the Ministry of Works and Infrastructure of the State and the rural dwellers. The consultation aimed at collecting data on the activities of the government on the connection of the state rural areas to the country’s national grid (electricity) within the period under review. Finally, the study will adapt system and empowerment theory to guide the researcher in clarifying the relationship between the independent variable, the moderating and mediating variables, and the dependent variable, respectively. Figure 1.1 and Figure 1.2 below are the political maps of the Federal Republic of Nigeria showing the entire states of Nigeria, the (36) states and the country’s Federal Capital Territory (FCT), which all are involved in the research. The map also identifies Niger State as the study area, sourced from the State Ministry of information (2015).



Figure 1.1
Map of Nigeria
Source: NIGER Ministry of Information (2015)



Figure1.2
Map of Niger Showing the 25 Local govt areas of the state
Source: Niger State Ministry of Information (2015)

1.6 Significance of the Study

This study emerges as a result of mismatch and inconsistencies of the previous research; thus, the present study intends to produce new knowledge in the field of electricity infrastructure, rural development, the moderating roles of political will on electricity infrastructure, good governance, as an intervening variable mediating the relationship between electricity infrastructure and rural development, the standard of living of the rural dwellers, identify avenues to address the electrification problems in Niger State rural areas. The study equally proposed a new model for electricity infrastructure.

1.6.1 Practical significance

The essence of any study is to improve the existing knowledge; thus, this study shall generally enhance the roles of electricity infrastructure in the state's rural areas. Previous studies over the years have independently evaluated the impact of electricity infrastructure and rural development. Therefore, the study assists in bridging the gap by introducing political will and good governance to understand the relationship between the four variables. In the same way, the study hopes to orientate the stakeholders of electricity infrastructure and help as an input to a vital decision that confronts the state on infrastructure. Since impact assessment is perceived as a management instrument to measure the effects of programs or projects, this study also guides the government of Niger State to establish whether or not the resources invested in electricity infrastructure produces the expected result for the target consumers.

In the light of the underpinning theory adopted in this study, the study shall bring to the fore the empirical role of system theory as it relates to an organization as a constituent unit and also establishes the reason why the absence of one constituent unit affects the performance of the other unit in an organization or in solving an organization's problems.

1.6.2 Significance to societal transformation

Governments at all levels (national, state, and local) expend resources on the felt-need projects of its citizen to improve their living condition. Therefore, the study shall assess and bring to the fore if the end has justified the means. However, policy assessment is ill-conceived as an undesirable policy process designed to discover flaws, marginalize and shift mistakes to policy formulators and implementers. Yet, the study shall guide the rural people to assess their government's performance in providing electricity services in the state's rural areas. Since policy evaluation is one of the weaknesses of developing countries (Baba, Achoba & Otaro, 2015; Etiaba, 2015), this study shall be a driving force for the government to sum courage and invest in the monitoring and evaluating activities of electricity infrastructure in Niger State and beyond. This would impact tremendously the Southwest, South-South, Northwest, and other regions, Lagos and Kano State in particular, which are the country's industrial base. This would help to re-awakening the over 400 industries that were closed down, leading to about 500,000 workers being jobless in Kano state (Sambo et al., 2012).

More importantly, this study shall encourage the Federal Government of Nigeria to invest in the significant hydropower stations and others accrues the country, with

proper monitoring and evaluation of the activities of stockholders to avoid situations that happened development in the past, where billions of naira were allocated to a bottomless pit. Such steps would positively impact the country's economy and promote small-scale industries (Chineke et al., 2012; Yusuf et al., 2015).

1.7 Conceptual and Operational Definition of Key Terms

This section concurrently explains the conceptual and operational definitions of the critical variables used in this study. The explanations are demarcated by paragraph.

1.7.1 Electricity Infrastructure

According to Meier (2010). Electricity infrastructure is a comprehensive enabling technology that transmits energy from producer to consumer direct and regulates energy movement. In other words, Bensch and Peters (2011) conceptualized electricity infrastructure as the generation, transmission, and distribution of energy or power system that are indispensable to other infrastructure required for the development of the economy. Electricity is one of the essential sources of energy or power that allows people to generate heat and light for the operation of industries and domestic use (Grigsby, 2016).

Electricity infrastructure here refers to the essential electrical energy needed for the operation and development of the state's rural areas. Infrastructure relates to the economy through multifaceted processes. Electricity could occur naturally on the earth and is manufactured artificially by humans. Lightning is an excellent illustration of electricity occurring naturally. The generation of energy at a power plant using a

massive turbine and generator is an example of man-made electricity. It exhibits several well-known phenomena, including lightning, electromagnetic induction, electric current, and static electricity (Aghion et al., 2013; & Muhammed).

1.7.2 Rural Development

According to Rashid (2015), RD refers to the measures employed by the government to better the lives of its people residing in rural areas and provide the essential infrastructure, including Schools, energy, water, roads, and hospitals aimed at improving the economic and social development of the state. Although, the rural area's development depends on primary production such as agriculture, forestry, fishing, local mining, and animal husbandry, among others (Mashreque, 2012). This is why rural development becomes unique for the state in terms of its involvement in developing nations' economies which is broader and more specialized than 'agricultural development'. This made it distinct and broader in scope in relation to the overall economic growth and more clear in its focus on poverty and inequality. While agricultural economics and "RD" have a lot in common, the type of study which enhances the understanding of the forces that drive "RD" is quite different (Harris, 2011). Thus, the aims of development center on enhancing the entire value of human existence below:

- i. Improving people's standard of living via proper growth processes, which include income and consumption, nutritious food, medical care, and education.

- ii. Fostering the growth of people's self-confidence through developing sociopolitical and economic institutions and organizations that encourage human progress.
- iii. Enabling individuals to choose their socioeconomic lifestyle by expanding their accessible options, such as the diversity of products and services (Micheal, 1982).

Therefore, RD is defined in this research as the process of promoting or improving the quality of people's life economically in the State. That is why the word "improvement of life" in this setting signifies the power supply's role in Improving the state's socioeconomic development.

1.7.3 Political-Will

Betancourt and Sanguinetti (2008) referred to political will as a governmental commitment and the capacity to act where necessary in furthering or reversing the process of democracy. In other terms, political will means the intention or goal to undertake the project(s) that directly benefit electorates or enhance the meaning of lives.

In this research, political will refers to a political decision and motivating drive that results in political action. Political will would be acknowledged when three aspects are considered: intensity, salience and opinion. The political will exists due to the unwavering commitment, concentration, and all-encompassing, integrated longest-term plans across the value chain. (2014) (Little, 2010; Abdullahi & Abdullah).

1.7.4 Good Governance

The concept of governance involves managing a state toward achieving public goods and services that would impact the cities' lives politically, economically, and socially. It can also be seen as a process of decision-making and implementation. It refers to the procedure and institutions where decisions are made and implemented (Idris, 2017;& Fisher, 2010).

In this study, Good Governance is perceived as a driving force in electricity power reform in Nigeria, as stated (Chineke & Ezike, 2010). Transparent political determination and good governance would create strategic institutions to combat corruption and ensure accountability and purposeful budgetary allocation. (Chineke; et, al 2010). Similarly, Ogbeidi (2012) stressed the need for an attitudinal change in Nigerian political leaders to exhibit political will and good governance toward actualizing state policies. Similar studies only emphasize electricity and RD, as stated by (Cabraal, Barnes, & Agarwal 2005; Chambers, 2014; Das, 2008; Goetz & Gupta, 1996; Shaaban & Petinrin, 2014). However, the literature reviewed so far has not shown any study that evaluated the impact of EI using good governance and political will as intervening variables.

1.7.5 System Theory

Biologist Bertalanffy introduced systems theory in the 1930s, and this is concerned with the network of relations that advocates a universal view of an organization rather than its constituent part. The theory provides a logical framework to recognize an organization in general as an organism that identifies the interdependence among

personnel, the impact of the external environment on the organisation's structure, and the influence of stakeholders of the organization. System theory explains the importance of integration and collective responsibilities in an organization to accomplish a common task. By implication, an organizational problem cannot be solved in isolation from the interrelated components but deserves the contribution of each member of the organization to address such problems (Easton, 1967).

In this study, system theory is considered a guiding principle using its three elements, input, process, and output, to provide relevant information about EI and its relationship to RD. The theory explains the causes of a phenomenon. In this context, the emphasis is on the government policy on EI and its effects on the observed outcome (RD). The viability of EI (success or failure) is directly linked to the “process” represented in this study as “political will” This is the willingness of the political actors to execute policies or programs that have a positive impact on the citizens. Processes are about the participation and interaction of the beneficiaries on the policy agenda of electricity production, transmission, and distribution. However, the input is EI and its dimensions. The process is political will and good governance, while the output is RD.

1.7.6 Empowerment Theory

The concept of empowerment provides the enabling environment for the poor to assess the ability and capacity to participate or negotiate with influence, control, and hold accountable the institutions that would impact their lives (World Bank, 2002). Participate in, negotiate with, influence, control, and hold accountable institutions that affect their lives (World Bank, 2002).

There is a conceptual and operational relationship between empowering the rural poor and infrastructural development. Human capital development is necessary for the sustenance of electricity and other infrastructures in Niger State rural communities, and this means that educational empowerment and the availability of electricity would lead to economic empowerment, which would enhance the living condition of the rural people and consequently leads to small scale industries and home-based businesses (Grooteartt, 2003; & Akokotu, 2008).

1.8 Plan of the Study

In conclusion, this chapter highlights the background of the study, problem statement, research question, and objectives, as well as the scope and significance of the study respectively. Subsequently, chapter two shall include emphases on the literature review that captures the relevant variables of the study, such as EI and RD, among others.

Furthermore, chapter three shall discuss the methodology adopted, such as the research paradigm, research design, sampling, and population. Also, survey the sampling framework and instrumentation. It further discusses the data collection, procedures for collecting data, operationalization and measurement of the variables, and the method of data analysis. The fourth chapter shall focus on quantitative data presentation and analysis, while chapter five shall dwell on qualitative analysis. Chapter six shall be concerned with the discussion of findings vis-a-vis contributions to the study and policy recommendations.

1.9 Chapter Summary

In conclusion, this chapter introduces the essential aspect of electricity infrastructure from a global perspective to the rural area of Niger State. This chapter also explains the impact of the independent variable and its contribution to the development of several countries. Particularly the development of the rural areas as well as identifying basic difficulties confronting EI that help establish this study's problem statement and set some objectives to offer a direction for the study.



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter mainly reviewed the relevant variables identified in this study and briefly described the basic concepts such as development, Rural Development, Political Will, Good Governance, Electricity Infrastructure, and their dimensions like Electricity Generation, Transmission, and Distribution. In examining the variables, the researcher carefully considers the views of scholars on the subject matter, especially areas of convergence and divergence opinions, to enable the researcher to identify gaps and develop hypothesis and theoretical framework, respectively.

2.2 Rural Development

The word “development” in the global phrase comprises the need to arrange for better lives for less privileged people in less developed nations. This includes economic and human developments, including health, educational system, nutrition, and environment, which is hygienic. The concept of development is a relative term that makes its definition elusive. For instance, Michael (1982). Opined that development is not only an economic phenomenon. It embraces more than the financial and material well-being of an individual. Consequently, the author perceives development which refers to a multidimensional system encapsulating the re-organization or re-orientation

Processes of the socio-economic system completely. By extension, development involves institutional, social, and administrative changes.

In connection with the above, the development in rural areas refers to the process which increases the chances of the individuals residing in places considered isolated areas to have a quality and a better standard of life (Ezeyi, 2013). In other words, RD mainly means improving the socio-economic conditions and quality of life of developing societies in line with the natural endowments and the scenery of the rural area, preserving its unique resources and established culture” (Szakál, 1998).

The major point of discussion in the 21st century all overworld is the paradigm shift from international development plans and conventionalism to modernism or progressivism (Sewell, 1980).

This transformation of global strategies Inspired the approval and subsequent declaration of Millennium Development in the year 2000 by the United Nations general assembly known as Millennium Development (MDGs), as well as western power's commitment towards the eight specific development targets by 2015. (Oldekop et al., 2016). The expansion of the MDGs agenda to 2030 demonstrates the global communities ‘acceptance of the developmental principles, added with the current affirmation of a distinct urban Sustainable Development Goal and the resulting creation of Habitat III marks a watershed moment in global development discourse on towns and cities concerning rural regions (Abdul-Salam & Phimister, 2016; Parnell, 2016).

Rural development signifies a land area situated outside the metropolises with less population. It is an agrarian society with few or nonexistent basic infrastructures, like electricity, portable drinking water, road network, communication services, and standard hospitals and schools (Goh, Kim, Nam, Choi, & Moon, 2015). Similarly, the united states of America's Bureau of Census categorise individuals living in a particular society with a population below 2,500 as a rural community. In Nigeria, a rural area has less than 20,000 people. Rural areas are generally recognized by several characteristics aside from population. This includes infrastructural development, occupational differences, accommodation, and economic status. Others are illiteracy, disease, poverty rate, etcetera (Goh, Kim, Nam, Choi & Moon, 2015).

In addition, a study reveals that India makes up 33 percent of the entire population of poor people globally. In comparison, China has 13 percent population of the world's poor people, and Nigeria accommodates 7 percent of the population of the world's poor individuals.

In the context of the energy crisis and global climate deterioration, the sustainable development of clean energy will become a new direction for future energy development. Based on the development process of clean energy in China in the past ten years, studies expound on China's clean energy policy and development plan show that the development of hydropower, wind power, and solar power in China in recent years has contributed significantly to development. It provides a reference for the policy decision-making of China's clean energy development.

More so, in 2018, China consumed 3.27 billion tons of oil-equivalent primary energy, accounting for 23.6 percent of the world's total primary energy consumption. China's energy intensity (energy use per US\$10,000 of GDP) has continuously decreased since the 1980s, and it had an energy intensity of 2.41 tons of oil in 2018; however, this was still 2.97 times Germany's energy intensity, 2.14 times US energy intensity, and 1.49 times the world's average energy intensity. Constrained by its resource endowment, China relies heavily on coal for its energy use. In fact, China consumed 1.9 billion oil-equivalent tons of coal in 2018, accounting for 50 percent of world coal consumption. Coal consumption accounted for 58 percent of China's primary energy consumption, much higher than the global average of 27 percent.

Bangladesh and DRC, Known as the Democratic Republic of Congo, become the fourth and fifth countries having 6 percent and 5 percent, respectively (Gabriel, 2014). For clarification, Table 2.1 shows the top ten countries with a leading share of global extreme poor.

Table 2.1

Top 10 Countries with Largest Share of Global Extreme Poor

Serial Number	Country	Percentage
1	India	33
2	China	13
3	Nigeria	7
4	Bangladesh	6
5	Congo Democratic Republic	5
6	Indonesia	4
7	Pakistan	3
8	Tanzania	3
9	Ethiopia	2
10	Kenya	1

Source: Calculation from Covalent database (2014)

In relation to the above, Nigeria has been ranked as one of the most corrupt countries globally. Still, its relative ranking has also been upgraded to 152nd out of 159 countries because of a lack of good governance. Most Nigerians live without electricity, portable drinking water, standard hospital, education, and good roads (Egbefo, 2015). Finally, corruption is the misery of Nigeria's socio-economic development as the poor are continually left disproportionately underprivileged. This has rendered the development of democracy and the structure of societal opportunity to be more challenged (Ribadu, 2011).

Furthermore, rural areas are acknowledged as one of the instruments of economic development of any country because of their agricultural production of food, raw materials for industries, and supply of labour (unskilled). Still, rural areas are disadvantaged, materially socially isolated, and politically evicted. The rural

inhabitants suffer negligence in infrastructural facilities like portable drinking water, good road networks, standard schools, standard hospitals, and many more (Antai & Anam, 2014).

Categorizing some of the problems of the rural people and rural areas, the International Food and Agricultural Development (2010) placed infrastructure as the main area the Nigerian government abandons. Indeed, this is relevant to state that investments in the health division and education sector, power, and water supply primarily focus on the municipalities or headquarters of states and local governments (Rodrigues 2016). Moreover, the population of the rural community has inadequate access to essential services like standard primary schools, tertiary institutions, and standard health centres. Therefore, half of the population has been bedevilled with the problems of lack of access to potable water supply (Hooks, Lobao, & Tickamyer, 2016). Neglect on rural infrastructure has affected agricultural production, which is the rural dwellers' main occupation. The poor road network in the rural areas also hindered the rise of agricultural supplies and impeded farmers from selling their products at reasonable prices. Restricted accessibility slices subsistence farmers from sources of inputs, equipment, and contemporary agriculture technology and this keeps productivity very low.

The main objectives of the RD program include poverty alleviation and solving the problem of unemployment and developing basic social and economic infrastructure, training rural unemployed youth, and providing employment to marginal

farmers/labourers to discourage seasonal and permanent migration to urban areas (Rajasekar & Devi, 2014). Thus, RD's primary objectives centres on Improving people's livelihoods socially and environmentally (Baruah & Millo, 2013; Rajasekar & Devi, 2014): Through adequate access to assets, such as natural, physical, human, technological, and social capital, services, and control over productive capital (in its financial or economic and political forms) that enable them to improve their livelihoods on a sustainable and equitable basis (Baruah & Millo, 2013; Rajasekar & Devi, 2014).

2.3 Strategies and Programs for Rural Development

The rural economy is an essential part of the overall Nigerian economy. Since the dominant population of the citizens resides in the rural areas, the government took it as a priority to enhance the people's quality of life in rural places through the alleviation of poverty and also through the mechanism of self-employment and programs related to wage employment, as well as the provision of infrastructural facilities like potable water for consumption, power supply, good road network, health facilities, accommodation, and quality education (Baruah & Millo, 2013).

The authority has significantly committed its resources to RD; however, and does not reflect the present economic situation, which has indicated that 80 percent of the population of Nigerians that are living in rural places face inadequate infrastructural facilities (Chinn, EicheNigerreen & Ito., 2014; Tanzi, 2016 Strasser et al., 2016;). The return of Nigeria's democracy in 1999 has positively impacted the development and improvement of so many rural areas. RD concentrates on evaluating the living standard

of the rural people, which is generally measured with the delivery of health and social services, good living conditions, and income inequalities as indicators (Madu & Yusof, 2015).

That is why Idris (2011) perceives RD as a sustained set of actions by government agencies, Non-Governmental Organizations, and the rural populace to improve the living conditions of the rural people and as a course. This led to a sequence of transformations within the limit of a given rural area, which ultimately resulted in enhancing the overall conditions of the inhabitant rural areas. The variations in living conditions are higher on different elements such as improvement in education, health facilities, potable water supply, feeder road networks, electrification, and so on.

One of the vital global priorities is transforming rural areas into development-friendly and sustainable agriculture-friendly (United Nations Development Project, 2015), meaning United Nations Development programs. Conversely, in many rural areas, it was recognized that their development in the area of infrastructure had been diverted to the various urban centres. It further perpetuates poverty and facilitates the movement of people to urban areas in search of a greener pasture, subsequently aggravating the aging problem of the labor force in rural areas and broadening the gap in living standards, including infrastructure.

The organization called Energy Commission has initiated programs tagged as rural developmental programs, which involve construction, installations, piloting, and illustrating projects to enhance the people's standard of living in rural areas through the usage of renewable

energy resources and provision of the favorable condition necessary for swift rural industrialization in particular and national industrial development in general through the provision of job opportunities and the needed technical skills which in turn reduces social vices and rural-urban migration. In light of the growing interest in developing and using renewable energy resources, the Energy Commission embarks on research and development activities in several parts of renewable energy utilization. Hence, many technologies are feasible and ready for implementation, especially in the state rural areas of Nigeria (Adegami & 2013; Martišková, 2015).

2.4 Dimension of Rural Development

2.4.1 Living Condition

In this study, RD will be measured by looking at the living condition of the rural dwellers. Living condition is all about the conditions/state of life of a person(s), and the following are necessary to put body and soul together shelter, food, clothing, safety/security, and access to clean water. In other words, this is about people's and societies' general happiness, drawing negative and positive components of life. And perceives life fulfillment, including physical health, household, education, employment, prosperity, spiritual beliefs, finance, and the environment (Barcaccia, 2013).

According to Watts (2013), the circumstances of our rural areas and the people disproportionately located in the areas experience severe poverty and population growth. Also, the poor in developing countries are identified by economic groups such as landless, subsistence farmers, urban underemployed, unemployed, and unemployable (Watts, 2013). Rural societies lack rudimentary infrastructural facilities

and other necessary amenities to promote their living standards, like good roads, portable drinking water, power supply, and telecommunications. Others include a balanced diet, befitting accommodation, security in terms of employment, protection of life, property, industrial establishment, and satisfactory social services such as education and healthcare facilities, etcetera (Awotide, Diagne, & Awoyemi, 2013).

Awumbila (2014) averred that the predominant population of the world, Africa, and Nigeria in particular, is mainly rural and agricultural, until the late 80s when fast urban and industrial growth annulled the corresponding development of rural areas. Rural settlements in Nigeria, which exhibit the social and historical ethics and values of the people, have suffered impediments leading to the flow of able body men and women from the rural area into the cities, characterized by low incomes and rental houses, squatting as well as overcrowding to explain the poor living condition of the rural people (Awumbila, Owusu, & Teye, 2014; Tacoli, McGranahan, & Satterthwaite, 2015).

Nigeria is the most populated country in the region of Sub-Saharan Africa. Also, its significant cities include Kano, Lagos, Kaduna, Niger, and many more, record several hundreds of thousands of new occupants annually and making the living standard below global standards, with over 70% of the population living in precarious slums in a particularly vulnerable environment (Fadamiro & Adedeji, 2014). By implication, most Nigerian society and its people live in abject poverty while insignificant numbers of minorities, mostly in politics, live in affluence. These skewed economic relations

do not reflect the terrestrial spread of the country's resources but are a product of classical miss governance and inequality that violate economic principles (Aluko, 2012). An RD policy always succeeds if there is proper active cooperation between the government and rural community, the immediate beneficiaries of that development. The government has to engage in a proactive remedial policy to manage the population growth, especially in electricity, to discourage rural-urban migration (Fadamiro & Adedeji, 2014).

2.4.2 Household Income in the Rural Areas

Household income is the second dimension to measure RD as it relates to electricity supply in Niger State rural areas. Conceptually, income is the benefit and gains that an individual or business gets in Exchange for the provision of services or through investing capital. In other words, it is cash received, particularly regularly, for work or through investments. Conversely, household income refers to all household members' total earned and unearned income (Nishikawa, Kamiya, & Kawanishi, 2016).

Over the years, income disparity has substantially increased despite government policy intervention to correct the anomalies. The high level of income inequality in developing economies is more pronounced between the rural areas and urban centers, the rich and the poor, and the educated and the illiterates, among others (Ravallion, 2014; Solt, 2016). Nigeria has experienced a swift rise in income and non-income inequalities and poverty levels for the past ten years. This rise in concerns is one of the factors that contributed to the non-actualization of the 2015(MDGs) poverty reduction target (Kanayo, 2014). The main economic activities of the rural areas in Nigeria are

farming and the rearing of animals. That is why their income sources are categorized into agricultural productions like growing crops and livestock, including non-agricultural such as petty trade or self-employment and salary income (National Bureau of Statistics NBS, 2014).

Statistics have shown that almost 75 percent of Nigeria's householders in rural areas earn their income from agriculture through the rearing of animals and farming, even though many of the households consume their farm products, and 20 percent of the rural farmers earn their income via wages such as salary while 65 percent are from household enterprises. In the same vein, 20 percent of households in urban areas earn their living from agriculture, 55 percent from wages, and 80 percent from household enterprise (Adepoju & Obayelu, 2013; National Bureau Statistics, 2014; Olawuyi & Adetunji, 2013). Similarly, there is variation across the six geo-political zones because some households sell their agricultural products, and others consume them. For instance, the Northern Central and Northern Eastern are endowed with fertile land. As such, they have large farming households that sell their crops and livestock harvest, while households living in other parts of Nigeria's South-South and South-West remain the least. The South-South gets the highest fraction of farms households (60 percent) who engaged in agricultural activities for home consumption (NBS, 2014). Figure 2.2 chart below illustrates the sources of income among Nigerians in both rural and urban centers.

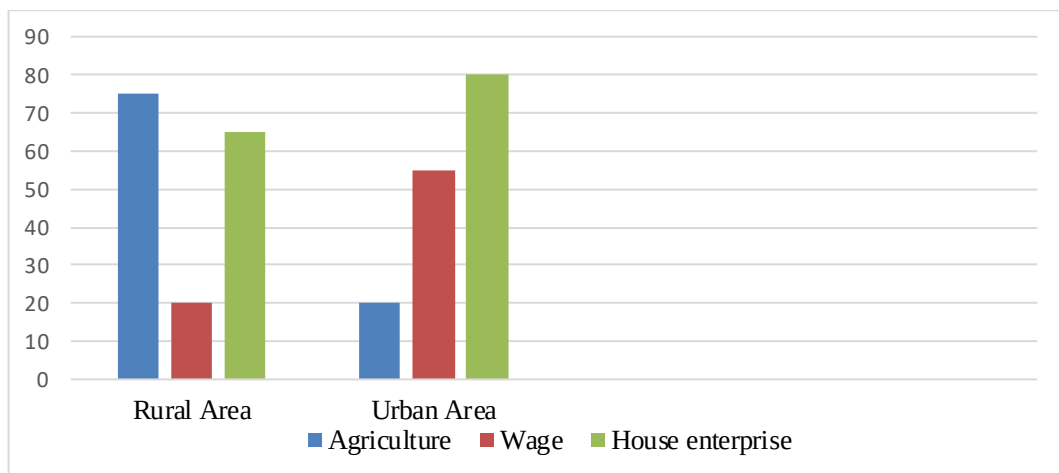


Figure 2.1
Income Source for Nigerian Households
 Source: National Bureau of Statistics (2014)

In addition, another study shows that 76 percent of households with more highly educated house leaders have a higher income than those with few educated persons or are illiterate. Similarly, male-headed families have a higher income than females (36 percent to 21 percent). By political zone, therefore, the households in the region of Southeast are the least to have such income at 26 percent, while their counterparts in the South-South are the most likely at 42 percent (National Bureau of Statistics, 2014). On the final note, this is noted that by demographical standards, economics, and education, there are significant differences between rural and urban income households.

On the welfare growth of the inhabitants of rural areas, Khandker (2012) affirms that electrification brings both direct and indirect transformations in household energy-use patterns and the general conduct or behavior of the people. For instance, Switching from kerosene to powered electricity offers a much-advanced level of household

lighting (Khandker, Barnes, & Samad, 2013). Similarly, a study reveals that the income and expenditure of households in Vietnam with electricity were higher than those without electricity, even after amending for inflation between the two assessment years. Also, the same income category of people increases from 2002 to 2005. For instance, in 2002, the income of households with electricity was 33 per cent above households without electricity, whereas in 2005, the variation was about 5 per cent less. Conversely, for households deprived of electricity, expenditure is less and educational results are worse in 2005 likened to 2002. In the same vein, for households with electricity, educational effects were constantly above households without electricity (Khandker et al., 2013).

Bridge et al. (2013), in a collaborative study using the Nepal living Standards Survey-III (NLSSIII), averred that causality runs both ways. By implication, income explains whether householders are connected to electricity; conversely, a household connected to electricity significantly influences their income. This is because a household connected to electricity raises consumption per capita by 18 percent on average (Bridge et al., 2013).

2.4.3 Health Care Service Delivery

The impact of electricity in this study will be assessed considering its relationship with providing efficient health facilities and services in the State's rural areas. Health is a state of being free from illness or injury. According to World Health Organization (2014), Health refers to a state of total physical, mental, and social stability or well-

being characterized by not merely the absence of disease or infirmity. Health infrastructure refers to the quality of physical, technological, and human capital available at a specific period. It is part of a larger concept of the health system, which contains the health policy, budgetary allocation, implementation, and monitoring (Aluko, Arowolo & Ayobami, 2015; & Efe, 2013). The physical structure comprises the following.

1. Buildings 'some structures, including pipe-borne water, good road networks, electricity, and so on, in the healthcare system, and
2. Technological equipment for hospital usage, including surgery services (Efe, 2013).

Furthermore, health infrastructure encompasses people, institutes, and legal or under the framework of law, all interrelating steadily to marshal and assign resources primarily for health management, prevention, and cure of diseases, infections, and injuries. And can also be deduced that the healthcare delivery's structure is intricately linked to the quality of health personnel, efficient management, adequate financing and communication (Efe, 2013; Eskandari, Abbaszadeh, & Borhani, 2013).

Rural Health care remains one of the biggest problems facing most developing nations worldwide. According to DeSouza, Rashmi, Vasanthi, Joseph, and Rodrigues (2014), serious health challenges in India affects 70 percent of the citizen in rural areas. As a result of inaccessibility to public health care facilities and poor quality of health care

service delivery in rural areas, the mainstream people in India are more comfortable patronizing the local private health sector as their first choice of care; this necessitates the introduction of the usage of mobile phone to receive health information. The mobile phone was acceptable in rural India as a tool for receiving health information and supporting healthcare through health interventions.

Considering the importance of healthcare services, Singer and Badaya (2014) attached humankind's success to sound health. Based on that notion, the Indian government considers national health care services an equal citizen right. Conversely, in the current situation, Indian rural health care experiences a crisis above other social sectors, yet, they provide efficiency more than some Developing countries in Sub-Saharan Africa (Nnabuihe, 2015). The provision of quality health is a fundamental right of all Nigerian citizens. However, in Nigeria, the attitude to health delivery patterns is below expectation and far from the international standard, despite enormous resources committed to all health-related programs and projects in our annual budget (Uzochukwu et al., 2016). Nigeria is one of the countries in Africa with the highest numbers of human resources for health (HRH). Though like other 57 HRH crisis nations, still the number of nurses and midwives, as well as Doctors, is not sufficient to cater and deliver basic health services as a result of massive migration to foreign countries for higher wages, and the few that are in our health centers prefer to work in the metropolis as a result of poor infrastructure to practice their profession in our rural areas (Welcome, 2011).

Nigerian health care has undergone several communicable disease epidemics year after year. The shortage of human resources, unwilling community participation, and inter-sector coordination make the circumstances of health facilities worst in Africa and Nigeria in particular. The underlying factors that are accountable for the failure of effective health management in Nigeria and other developing countries involve government emphasis on the infrastructural development in urban areas to the detriment of rural areas (Nnabuihe, Lizzy, & Odunze, 2015).

2.4.4 Social Services

Social services are public or social infrastructures that are fundamental to the well-being of individuals and communities provided by government or private organizations. The meaning of social services differs subject to the perception of what should be involved as a form of social service (Godwin, 2014). The Electronic Encyclopedia of Chicago defined 'social service as a variety of programs made available by public or private agencies to persons and families who need special assistance (Erondy, 2015).

Before the advent of the colonials to the African continent, the primary responsibility of an average African and common culture is to cater to the family. The social structures of Africa influenced a system of organizing behaviour and economy, a cultural system for the protection of its distinctiveness and freedom, a method of the institution for the recognition of societal and political objectives, and a system of control and integration (Khan, Morrissey, & Mosley, 2016). Social services are public or social infrastructures that are fundamental to the well-being of individuals and communities provided by government or private organizations. The meaning of social services differs subject to the perception of what should be involved as a

form of social service. (Joanne Godwin) The Electronic Encyclopedia of Chicago defined ‘social service as a variety of programs made available by public or private agencies to persons and families who need special assistance. (Erondy, 2015).

Rural social service has been one of the popular policies and plans of the Nigerian government over the years, yet, the condition of rural societies is deteriorating in its place of advancement. What could be the justification for this unsolicited, unhealthy, painful, and intolerable state of the rural people? A study identifies illiteracy in rural areas as the major causal factor, as the rural people do not know their constitutional right to compel the government to enforce its policies and programs in rural areas. In other words, the people in rural areas lag in accessing information to achieve their objectives. Nigeria is stared as the giant of Africa for her prominent roles in peacebuilding, conflict resolutions, and investment in human and financial resources to tie the continent. Though, the vast resource legacy does not replicate the economic realism, as over 80 percent of the people in the country in the rural areas did not have significant basic infrastructural facilities that would make their life meaningful (Chinn et al., 2014; Van de Walle, 1996).

Re-counting the UN argument to Nigeria, the paradox of growth describes the economy without poverty reduction and the trickledown effect of growth on the poor, sluggish response of the government to the pervasive and persistent social problems among the subjugated in the rural areas (Mentan, 2014). Rural areas play important parts in political and socio-economic growth, such as agriculture serving as self-employment, sources of food production, and provision of raw materials (Leigh & Blakely, 2013).

According to Nnabuihe et al. (2015), deprived rural dwellers have lived in the shadow of dominant concern for urban or state government's prosperity, development, and desires. In other words, considerable attention in the urban regions has been on the growth of headquarters at the detriment of the rural people, who are perceived as ignorant, backward, and primitive. The government debars and ignores rural interests; fiscal interests and social infrastructural amenities are mainly in the state and local government capital cities. The negative effect has affected the rural people, which calls for a rethink of the goals and process of RD to safeguard more positive results for the rural areas.

Additionally, Erondy et al. (2015) observed that the rural masses suffer from several low-output, social and economic regression owing mainly to ignorance which is also a direct consequence of poor social services welfare despite the country's endowed human and natural resources; our rural communities are suffering as a result of poor indices of development as a result of corrupt leaders and deliberate poor management of finance and material resources

Studies have revealed that adequate power supply remains the basic aspect of the economic, social services, and environmental developments of industrialized states. Consequent to the high population growth and the desire for modern devices for industrialization, the electricity demand is increasing at a very high rate for both domestic and industrial use. However, most of the developing countries are weighed down by energy crises as a result of their dependence on non-renewable energy sources

(which are pollution agents) that have limited generating capacities coupled with poor distribution channels (Abdul-Salam & Phimister, 2016; Bhattacharyya & Palit, 2016).

2.5 Electricity Infrastructure

In this study, the term electricity infrastructure refers to a set of physicals phenomenon allied with the presence and flow of electric charge. Power supply is one of the most important sources of energy or power that allows people to generate heat and light for the operation of industries and domestic use. This refers to the basic physical and organizational structure needed for the operation of the society or an enterprise or the services and facilities necessary for an economy to function. Infrastructure relates to the economy through multifaceted processes (Aghion et al., 2013). This is perceived as an intermediary input to high production (Moyo, 2013). In this study, EI will focus on man-made electricity with the use of a power plant, and large turbine, and a generator. It offers a wide variety of well-known effects, such as lightning, static electricity, electromagnetic induction, and electric current. Electricity as a concept would be better appreciated through the following dimension. Since the majority of the rural people are illiterate, attention would be given to ensuring the stability of power,

The supply of infrastructural facilities is critical to economic progress, social unity, and environmental sustainability (Wakelin Iger, & Schmidt, 2013, Edomah, Foulds, & Jones, 2016). The EI has become a barrier to developing countries' sustainable development worldwide (Blum et al., 2013, Bhattacharyya & Palit, 2016; Edomah et

al., 2016). Infrastructure development is motivated by governmental considerations explaining the deplorable structure state in emerging countries. Nonetheless, governmental choices about infrastructural constructions regarding the host communities are being confronted with inadequate attention (Ewugi& Usman, 2016). These have contributed to the risen expectations of communities in terms of the installations. This expectation brought problems to the authority and its immediate communities due to the authority's failure to fulfil the promise to the people.

Electricity enhances the development of the rural and urban regions, owing to its utility for other infrastructures like schools, hospitals, irrigation systems, small and medium-sized industries, and ICT that has facilitated globalization. All of these can be accomplished with the aid of efficient electricity to the communities (Chi & Mbulawa, 2016, Kroes, Neelis, 2011). The economic literature on infrastructure is frequently more concerned with or quantifying the influence of infrastructure, specifically regarding the country's socio-economic activities like pollution, enhanced educational system and health facilities, employment as well, agricultural output, wealth and income, and so on (Chi&Mbulawa, 2016).

According to scholars, infrastructure is mostly evaluated through economic implications (Chi&Mbulawa, 2016, Hanson, Owusu, & Pupilampu, 2016; Torrisi, 2010), whereas both engineers, as well as urban planners focus on the specific advantages that accrue to the nearby region (Chi&Mbulawa, 2016, Ebrahimnejad, Mousavi, & Seyrafianpour, 2010; Avenger, 2010). That is why, Ebrahimnejad et al.

(2010) termed governmental critical infrastructural facilities as any form of risk associated with machine failure, human life loss, and environmental degradation respectively.

Electricity is a necessary invention for economic progress to be sustained, which increases the adequacies regarding the distribution of productive wealth and firms, which in turn increases employment and income production. The greatest link between nations whose economy is growing significantly with adequate measures aimed at alleviating poverty has been proved by countries such as China, Vietnam, and India. Also, scholars like Ekeh (2012), Oyedepo, Fagbenle & Adefila (2011) noted that World Bank affirmed China's energy level and equated to a 25% and 35% drop in labour costs for nations like Nigeria, Kenya, and Zambia. Consistently, affordable power supply promotes the establishment of various household enterprises. Power supply in the modern era enables the poor to profit from innovative communication technology that facilitates effective commercial decision-making. Electricity is a critical component of telecommunications, which includes Internet facilities and basic phones and radio (Oyedepo et al., 2015).

The power supply has become one of the primary tools used by developing nations to overcome its supply through the provision of dependable, affordable, as well secure energy to both rural and urban areas, which impacts global interrelations among the comity of nations (Oyuke, Penar, 2015, Howard, 2016). Furthermore, Solar energy has been viewed among the main viable solutions because of its non-polluting, plentiful,

and its availability to all emerging nations (Howard, 2016, Nna., 2016). in relation to the above, Electricity has efficiently enhances accessibility to modern markets and their services, generation of revenue streams advances awareness and business education, and minimizes transactional costs while enhancing the timeliness and reliability of business transactions, resulting in lower production costs, and prices, which in turn increased demand (Blum, 2013).

Most of the emerging nations globally, their governments are responsible for infrastructure supply. Additionally, the industry's major cost, as well as its indivisibility, discourages some of the investment of the private sector. Second, due to the indirect nature of the payoff and the Length of time, it is most unattractive to private investors. Furthermore, suppliers externally provide all that the producer may not be included in the valuation. In light of numerous alternatives, less hazardous and more accessible investment opportunities that provide the possibility for bigger and faster earnings, insignificant numbers of small scales business owners are ready to be committed to infrastructure business enterprises (Blum, 2013, Ajayi et al., 2011; Howard, 2016, Fagbenle, et, al 2011).

Mineral resources, including petroleum, Coal, natural gas, and uranium, and the major forms of renewable energy are being endowed in developing countries across Asia and Latin America. However, electricity's overall status in rural and urban regions did not reflect the resources under its control due to the differences in economic Strength, technological and energy sources. The energy sources utilize to generate power supply

depend on the nations. For example, Ghana's (AEG) power supply of 47.3 percent, servicing most of the entire population in the areas of urban centres (15% to 17% of the entire rural regions in general). This can be compared to that of West Africa, an average of that 17.9 percent. As a result, the vast majority lack access to power (kwamiTsivor, 2014). Around the population of 600 million of the Sub-regional parts of Saharan Africa, particularly Nigeria, has been bedevilled with a lack of adequate power supply (Howard, 2016, & Lee et al., 2014). These factors have caused homes to switch to candle and paraffin illumination, which medical professionals have established is contributing to an increase in death and sickness associated with what is known as air pollution (Lee et al., 2014 & Lee et al., 2016). As a result, adequate power supply has decreased economic growth by having a detrimental effect on many facets of life, including health, income, education, and efficiency in terms of labour (Lee et al., 2014, Chakravorty, Pelli, & Marchand, 2014).

Concerning the above rural electricity scarcity, some developmental organizations and governments highlighted that rural power supply becomes necessary for economic growth (Chakravorty, Pelli, & Marchand, 2014, Kirubi, Jacobson, Kammen, & Mills, 2009). Reliable electrification is critical to human socioeconomic and environmental growth. As a result, the demand for energy in emerging nations' household and industrial sectors is constantly increasing.

2.6 Dimensions of Electricity Infrastructure

The dimensions of electricity focus on Electricity Generation/production (EG), Electricity Transmission (ET), and Electricity Distribution (ED)

2.6.1 Electrical Generation (Production)

Electricity generation is the process by which energy/electricity is produced from the primary sources for onward transportation to the transmission and distribution companies/plants over long distances for final users. Electricity by nature is often produced as it's not readily available. The quantity of electricity produced and benefitted by many consumers is, thus, referred to as EG. The transmission of electricity from the medium grid to the lower grid and then to consumption centers is controlled by respective distribution companies in their respective regions (Ullah, 2013). The high voltage grid of the transmission of a country is determined by the size of the population and the number of electrical appliances.

The first Nigerian electrical power plant built in 1896 provided electricity in Marina streets, Lagos, between 6:00 P.M. to 11:00 P.M, respectively. The Public Works Department (PWD) was responsible for building the power plant. Later it was taken over by the Electricity Commission of Nigeria (ECN), comprising two major plants, such as 30 kW, 1000 V, and 80-cycle, the Single-phase supplies and was mainly used for lighting purposes. There was an extension of light to the government house and, subsequently, the colonial hospital with a maximum of 24 KW. A third unit was installed in 1902 because of the growing demand for electricity for lighting, which was fast substituting the use of traditional desk lamps with oil from food sources. In 1909,

installed capacity significantly improved to 120 KW, with registered energy requests at 65 KW (Edomah et al., 2016; Sambo, Garba, Zarma, & Gaji, 2012). Nigeria is endowed with natural resources like solar, thermal energy, wind, hydro, and bio-energy. However, it still only produces 4,000 MW capacity to cater to the electricity needs over 180 million people, which is grossly inadequate for the country (Egboh, 2011). In December 2013, the maximum capacity of the power plants was 6,953 MW. However, the available capacity was 4,598 MW, and the actual average generation stood at 3,800 MW. In the same vein, in December 2014, the installed capacity of the whole power plants was 7,445 MW and contradictorily the available capacity was 4,949 MW while the real average generation was below 3,900 MW.

Accordingly, investigation shows that national development needs sufficient and capital-intensive electricity supply, which encompasses generation, transmission, and distribution. Economic stability and development of superpowers like the USA, United Kingdom, Japan, and other nations are hindering stable electricity supply (Merven, Arndt, & Winkler, 2017; Rafindadi & Ozturk, 2016; Sbia, Shahbaz, & Ozturk, 2016). On the contrary, the dwindling funding of the power sector and poor political will coupled with low private sector participation have greatly affected EG in Nigeria (Sambo et al., 2012). A study reveals that Nigeria is one of the bottommost generators and consumption of electricity per capita in Africa. With the demand dominating the generation, there is unbalanced accessibility of rural communities to the electricity service in Nigeria due to inefficiencies overriding the allocated electricity resources added to the threat of fossil fuels (Shaaban & Petinrin, 2014).

A recent study reveals that with the incessant attacks on oil installations by the militants and frequent industrial disharmony with the electricity workforce, Nigeria's overall EG has dropped to an unprecedented (Anifowose, Lawler, Van der Horst, & Chapman, 2012; Kashubsky, 2016; Onuoha, 2016):

1. From 4,500 MW on April 3, 2015, to 2,800 and
2. Further low to 1,327 megawatts (Noguera-Santaella, 2016; Onwuka & Dike, 2015) and more recently, the generation capacity of Nigeria's power has dropped.
3. From 4,285 megawatts were recorded on September (16th, 2016) to 3,321 megawatts on December (1st, 2016) as a result of scarcity of gas (Times, 2016).

Furthermore, hydropower is considered the major source of electric power generation and supply in Nigeria because of the country's endowment with large waterways, waterfalls, and dams. Hydropower technology is one of the noticeable commercial renewable energies (RE) technologies in the electricity supply mix of Nigeria. The country has a 14,750 MW sum-total potential for hydropower. Renewable energy sources include wind energy with a potential of 150 000 terra joules per annum, produced by an average wind speed of 2.0–4.0 m/s, solar radiation projected at 3.5–7.0 kWh/m², and biomass at 144 million tons per annum. Conversely, these resources are yet to be explored, and only 1930 MW representing 14% of that, is presently being generated at Shiroro dam, Kanji dam, and Jebba, respectively, and thus represent about 30% of the gross installed EG capacity of Nigeria (Shaaban, 2013).

A study reveals that Nigeria's population is a similitude to Pakistan. While the totality of installed electricity capacity in Pakistan has consistently increased from 60 MW at the attainment of political independence in 1947 to 21593 MW in 2010, the electricity capacity of Nigeria has been decreasing considerably (Onuoha, 2016). This indicates significant growth for 63 years despite the socio-political as well as economic crisis in the country. Despite the gap between Nigeria and Pakistan, a study shows that production is behind the actual demand of the citizens. With the introduction of new reforms, the electricity sector has attracted private investment, which has been one of the major contributors to capacity improvement in recent years (Ullah, 2013).

Table 2.2
Nigeria Electricity Generation Profile

Year	AGA (MW)	MPG (MW)	MDEG (MWh)	TEG (MWh)	TESO (MWh)	PCES(MWh)
2007	3,781.3	3,599.6	77,322.3	22,519,330.5	21,566,192.2	156.2
2008	3,917.8	3,595.9	86,564.9	18,058,894.9	17,545,382.5	120.4
2009	4,401.8	3,710.0	82,652.3	18,904,588.9	18,342,034.7	122.0
2010	4,030.5	4,333.0	85,457.5	24,556,331.5	23,939,898.9	153.5
2011	4,435.8	4,089.3	90,315.3	27,521,772.5	26,766,992.0	165.8
2012	5,251.4	4,517.6	97,981.0	29,240,239.2	28,699,300.8	176.4
2013	5,150.6	4,458.2	98,619.0	29,537,539.4	28,837,199.8	181.4
2014	6,158.4	4,395.2	98,893.8	29,696,360.1	29,013,501.0	167.6

Source: National Electricity Regulation Commission (2015)

Note: AGA denotes Average generation availability, MPG means Maximum Peak generation, MDEG refers to Maximum daily energy generated, TEG signifies Total energy generated, TESO represents Total energy sent out, and PCES entails Per capita energy supply

Table 2.1 above shows that the EG/production stagnated at 29 000 MWh in the previous years, which signifies per capita generation, which has dropped as low as 167 kWh in 2014 (Advisory Power Team, 2015). However, in a different version, statistic reveals that with an installed capacity of 13 308 MW in 2014, only 6 158 MW were

active. Approximately 3000MW to 4,500 MW were generated owing to the scarcity of gas, water shortage, and grid constrictions or poor performance of the power plants has contributed to acute shortage of power across the country. In other words, 2 700 MW of power generation capabilities are regularly lost due to gas challenges in Nigeria, with one of the major natural gas deposits in the world. In addition, the Nigerian Energy Sector Program (2015) reveals that above 500 MW are lost due to water management, while several hundred megawatts are frequently lost due to line constraints which have seriously affected industries, commercial activities, and private households (Nigerian Energy Sector Program, 2015), Energy experts using contemporary energy modelling instrument projected that for Nigeria to achieve economy to grow and develop at a rate of 10 percent the country's EG by 2020 will be within 30,000 MW, and 78,000 MW by 2030 respectively (Sambo, 2015).

2.6.2 Electricity Transmission

Electric power transmission denotes the lines and sets of wires, called conductors, which transmit electric power from generating plants to the unit stations that deliver power to final customers. At a generating engine, electric power is “stepped up” to numerous thousand volts by a transformer and consequently delivered to the transmission routes (Iwayemi, 2011).

Numerous studies reveal that electricity transmission in Nigeria is fluctuating, while few argue that it has reduced drastically (Ekpo & Bassey, 2016; Olabode, Nwagbara, & Mathew, 2017). To improve electricity transmission in Nigeria, the National Electric

Power Authority (NEPA) was privatized by the Bureau of Public Enterprises (BPE) and the Bureau of Public Procurement (BPP) in 2014 to what was later called the Power Holding Company of Nigeria. (PHCN) However, some activities in the process were in early 2015. Hence, the institutions separated the successor companies into 11 distribution and generation companies. In the same vein, Nigerian Electricity Regulatory Commission (NERC) further unbundled the industry into six generation units, one transmission, and eleven distribution companies, respectively (Iwayemi, 2011).

Statistics indicate that Nigeria has 159 transmission network substations with (theoretical) transformation capacity of ~19,000MW and 15,022km of transmission lines (National Bureau of Statistics, 2014a). Currently, the transmission volume (5,300MW) is above the average operational generation volume of 3,879MW (average January to 15 August 2015). Though, far below the total installed capacity of 12,522MW (Advisory Power Team, 2015; Olusegun, 2016). Experts reveal that whenever operational generation capacity rises to the level of transmission capacity, then transmission will become a serious problem for electricity delivery services. In Nigeria, early signs were noticeable in July and August 2015. Thus, at an average of 7.4 percent (January to July 2015), transmission losses across the network are high in Nigeria. This leads to Nigeria's acute EI and operational challenges (Advisory Power Team, 2015).

The expert report reveals that the National Grid works at 330 kV and 132 kV high voltage levels (HV). In 2010, above 12,300 km of transmission lines (5,523 km of 330

kV and 6,801 km of 132 kV) linking 32,330 kV and 105,132 kV substations were functioning. At the present configuration (2014), the national grid has an installed capacity of 6,500 ft but can handle a wheeling capacity of a maximum of 4,500 ft. The long-term Planning of the Transmission Company of Nigeria (TCN) is to further improve the grid capacity and strengthen the installed generation capacity—to 10GW by 2014, 16GW by 2017, and 20 GW by 2020 (Nigerian Energy Sector Program, 2015).

An investigation shows that the government has committed huge resources to the generation and transmission capacity expansion in the past decades with the extremely poor result measured by frequent power outages and voltage variation (Iwayemi, 2011). Illegal connection proliferates a high rate of transmission collapse in Nigeria (Nweke & Umahi, 2015). However, investigation shows that the number of system collapses has fallen over the last seven years, from 42 in 2010 to 13 in 2014. Yet, the prevalence of forced outages has not improved at the same rate as maintenance difficulties due to its persistence on the just 67 percent average of maintenance works accomplished monthly between February to July 2015 (Advisory Power Team, 2015). In other words, transmission and distribution losses are substantial by international standards as the system damages are 5 - 6 times those in well-established power systems in the world (Iwayemi, 2011). For better appreciation, Figure 2.2 below shows Nigeria's percentage of transmission losses.

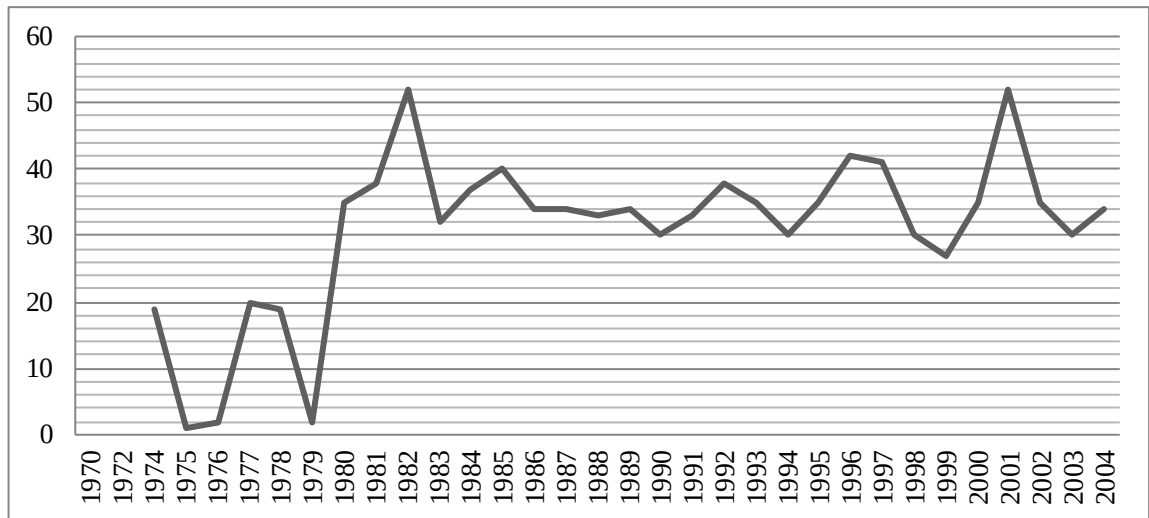


Figure 2.2

Percent Age of Transmission Losses 1970 - 2004

Source: Central Bank of Nigeria Statistical Bulletin (2015)

In addition to the above graph, transmission losses fell by 10 percent (June to August 15th, 2015) compared to the year's first four months (Nweke & Umahi, 2015). Exploration of power outages in Nigeria's transmission network is linked to frequent outages due to obsolete equipment resulting in recurrent cuts of conductor jumper, frequent earth faults caused by a regulation in overhead clearance, and refuse burning vis-a-vis circuit breaker (Sunday, 2011).

A technical committee report indicates that Nigeria's last transmission line was built in 1987, while the ongoing was yet to be completed. Nigeria's transmission system has been bedevilled with system collapses and recurrent forced outages. At present, the transmission capacity is higher than the operational generation capacity. Also, the transmission will speedily become limited owing to the present reality of the increasing operational capacity (Advisory Power Team, 2015). Institutional challenges affect all

phases of the power value chain, compelling Nigerians to rely on self-generation. According to the World Bank, about 41 percent of Nigerian businesses generate power (Advisory Power Team, 2015). In light of the above, it was recommended that the relevant institutions should religiously monitor the transmission system to avoid system collapse (Ajenikoko & Anthony, 2015).

2.6.3 Electricity Distribution

Electricity power distribution (ED) remains the final stage of electric power delivery. As the name suggests, it is the transfer of electricity from the transmission system to individual final consumers. After EG from the power plant and transmitted on high-voltage power lines, it is circulated to our homes and businesses based on local power distribution lines (Devaraj, 2015).

According to Aliyu (2013), the Power Holding Company of Nigeria's (PHCN) distribution network was apportioned into 11 regional networks and sold off to local and foreign investors, with a lesser stake reserved by the Federal Government of Nigeria. The distribution firms vary on their network scope, the number of customers, and geographic location. Based on the contract agreement with the Bureau of Public Enterprises (BPE), each distribution company is "allotted" a specific amount of grid energy (Aliyu et al., 2013; Dada, 2014). It is worth noting that supply differs, with some distribution companies getting additional and others a lesser quantity. This is mostly determined by the acceptance of the distribution company to agree with the offered volume.

Aliyu and Ramli (2013) attributed the electricity distribution challenges in Nigeria to a high rate of distribution losses such as technical, commercial energy not billed, collection losses, or energy billed but not paid for, respectively. Therefore, when the distribution companies were privatized, the transactions assumed particular loss levels. After the asset handover, nevertheless, it is obvious that the losses were above what was estimated (Aliyu, Ramli, & Saleh, 2013a). In 2014, about 46 percent of energy was lost through technical problems in Nigeria, and 12 percent of energy was equally lost through commercial activities, respectively. This poor state of electricity distribution in Nigeria is affecting the welfare and security of life and properties of the citizens, with adverse economic consequences for the country. The shortage of the national grid, particularly the inability of the EG capacity (Olatomiwa, Mekhilef, Huda, & Ohunakin, 2015) to meet up with the increasing demand, necessitates the agitation for increased diffusion of renewable energy sources (RESs) into the electricity supply mix (Dada, 2014, 2014). Accessibility to stable electricity is essential in realizing Nigeria's mission to join the league of the twenty most industrious nations globally by the year 2020 (vision 20:2020). Thus, without stable electricity, the task would be difficult to accomplish as a fundamental to sustainable economic development, which is grossly inadequate in Nigeria State. Today, Nigeria relies on petroleum reserves and its long aged hydro plant installation for EG to feed the 40% of its beneficiaries connected to the national grid (Aliyu, Ramli, & Saleh, 2013; Dada, 2014).

Furthermore, there is a disagreement on the electricity distribution rates across Nigeria. For instance, there is a division between the north and the south regarding the population ratio and megawatts. In the same vein, within the northern region, there is a sharp discrepancy between the mega-wattage allocated to the northeast, the north-central, and the western region. The electricity companies are owned by groups such as state governments. The renowned 11 distribution companies include Abuja, Benin, Eko, Enugu, Ibadan, Ikeja, Jos, Kaduna, Kano, Port Harcourt, and Yola. Table 1.1 and Table 1.2 in chapter one are the distribution of households with access to electricity by type of electricity supply in 2010. The distribution grid operates on 33kV and 11kV levels, meaning medium voltage (MV) and low voltage levels (LV). In 2010 more than 24,000 km of the distribution network were available (Nigerian Electricity Regulatory Commission, 2011).

Pertinent to point out here that the statistics of electricity services in Table 1.1 and Table 1.2 in chapter one were contested on the ground that they do not represent the true picture of electricity distribution in Nigeria. The statistics are more of theory than practice as the mainstream citizen cannot access electricity. According to Dasappa (2011), 46 per cent of Nigerian citizens have access to electricity. The struggle for considerable expansion of electric power generation has not concurrently been matched with the expansion of the transmission and distribution systems. This is peculiar in rural areas where the government emphasizes outdated grid extension for electricity without any corresponding generation system expansion. Consequently, only two percent of the rural households in Nigeria have stable access to electricity

either through rural electrification initiatives or self-generation by private individuals (Chineke& Ezike, 2012; Mohammed et al., 2013). Table 1.4 and Table 1.5 in chapter one clearly explain the details of Nigeria's electricity transmission and distribution.

Dada (2014) argues that consistent descent in power production results from insufficient funding, persistent economic deterioration, poor system maintenance strategies, and limitations of technical reliability. A drop was witnessed between 2007 and 2014 as the gross energy output of Kainji dam, Sapele, Jebba, Egbin, Shiroro, Ajaokuta, and Omotosho increased (Dada, 2014), While that of Geregu was unobtainable as a result of scarcity of gas supply resulting from attacks on oil installations by the Niger Delta militants (Sambo, 2015). Above all, the theoretical reforms lacked an implementation strategy to actualize the dream of electricity for all mantras.



2.6.4 Relationship between Electricity Infrastructure and Rural Development

Electricity is one of the basic infrastructures required for the operation of society, an enterprise, or the services and facilities necessary for an economy to function. Infrastructure relates to the economy through multifaceted processes (Aghion et al., 2013). This is perceived as an intermediary input to high production (Moyo, 2013). Therefore, infrastructure quality and quantity changes affect the attainment of increased production and, invariably, income generation, output, and job opportunities (Du & Temouri, 2015). Besides, infrastructure facilities, in the same way, increase the output of other factors of production (Kenfack, Bossou, Voufo, & Djom, 2014; Moyo,

2013). Rural electrification is one of the critical priorities of the government's program (Marshall, Quinlan, & Berry, 2016; Twine, Kahn, Scholtz, & Norris, 2016).

1. Reduce or alleviate poverty,
2. Amends imbalances in development, and
3. Improve the general well-being of the citizens by providing consistent power sources, healthier living conditions, health facilities, and delivery of several services to the rural populace (Marshall et al., 2016; Twine et al., 2016).

2.7 Political Will

According to Little (2014), political will is the mechanism of politics that brings and motivates forces which generate political action. Thus, Political will becomes attractive if combined with opinions, intensities, and absolute determinations, concentrations including integrated longer-term strategies cut across the value chain (Little, 2010; Abdullahi et al., 2014). Political will is a *sine qua non* to successful policy implementation as it is perceived to be a sustained enthusiasm of political leaders or administrators to marshal as well as invest resources aimed at accomplishing particular goals and policy implementation, programs or projects of the government (Messick, 2014, Little, 2010).

It was argued that counselling in developing nations like Nigeria to combat corruption and embark on peoples oriented projects requires political will. Otherwise, such advice will be considered empty (Messick, 2014). The author added most countries were marginalized because their leaders lacked the essential commitment and ability

(Messick, 2014). A comparative study on political will and the fight against corruption in Singapore, Ghana, and Nigeria (Abdulai, 2009) reveals that the Single most central factor that accounts for the different levels of corruption and sustainable economic development is the degree of political will show by leaders of the three countries in fighting the scourge called corruption. Political will is better assessed Using the following indicators:

- i. Autonomy and freedom of anti-corruption agencies in discharging their duties
- ii. Provision of sufficient budgets allocation and skilful and talented personnel for anticorruption agencies
- iii. Frequent incentives and sanctions to discourage corrupt behaviour; and
- iv. Encouraging citizen participation in policy processes (formulation and implementation).

In other words, willingness to support electricity depend solely on the commitment of the political actor, which in turn legitimize government through the provision of effective policies and program that have bearing on the citizens. The allocation of sufficient resources at the appropriate time is one of the factors of political determination (Abdullahi, 2014).

It is important to point out at this juncture that political will is essential for the sustainability and development of policy and program; therefore, it regulates the success or otherwise of a policy and program. The absence of political will in

governmental activities is responsible for the failure of most programs in the Sub-Saharan region of Africa and Nigeria in particular (Soderbaum, 2012). Their work on politics will bridge the gap between public health knowledge and action, demonstrating that for effective policy implementation, the government needs Stronger commitment, increased funding and community participation. Political will also refers to political determination and is about the efforts of government, non-governmental organizations, civil society, and religious and traditional leaders. For instance, the global determination to eradicate poverty in 2015 and subsequent extension to 2030 requires political zeal, support, collective participation, and sustainability of the aspiration (Abdullahi, 2014).

In governance, policy actions taken by both public and private institutions are assumed vital elements of such comprehensive strategies, though the exact methods or implementation strategies are more open to deliberations among the stakeholder and beneficiaries of such policy (World Health Organization, 2012). The study of Jia tong et al. (2011) revealed the existence of a positive relationship between political will and healthcare delivery. Conversely, a similar study shows that poor leadership commitment to the government policy in South Africa affects the realization of most of her political agenda. Obidike et al. (2013) observed that poor legislation, impunity, and laxity on the part of Nigerian governments to enforce the regulations guiding the program implementation have seriously hampered infrastructural development.

A study on political actions and its impact on social policy was carried out by Carbonetti et al. (2014) and revealed that the outcome of any desired policy depends on the Strongest major taken as a result of the political will. Also, the Strength of the public and private sectors relies on the impact of the effective services rendered to its people (Sahr, 2012). Added that the challenge to a political will is to distinguish between reforms designed to boost the image of political leaders and substantial efforts based on creating change (Sahr,2012).Despite frequent requests for societal action, development in the relevant policy arenas has been sluggish due to the absence of institutional will to take such action.

2.7.1 Relationship Between Political will and Rural Development

The dominant constituent of the world are the rural people in the rural areas. Hence, governments of both developed and developing countries have, over the years, considerably accorded attention to policies on RD (Chambers, 2014). All effort geared toward the development of rural areas has achieved minimal result, particularly in the emerging countries of Latin America, Africa, and Asia (Blaikie, 2016).

Political will is about transforming political plans into concrete action, such as the execution of laudable projects that will impact the poor people in both rural and urban centers, especially women empowerment and the provision of food security. Accordingly, Zivanovic (2010) explores that there is a close relationship between political will and the result of public policy. In other words, political will is a precondition to a successful public policy. Zivanovic (2010) further affirms that

behaviour, the role of individual actors, and the general personality of the society itself are factors that influence political will in most countries of the world.

Inequality is a universal language across the globe and is more peculiar in both rural areas of emerging and emerging countries of the world. However, it can be overturned by political will at both national and international levels. The enormous difference in income, power, and opportunity affects the progress of both developed and developing countries. There also exists a vast gap in access to education, healthcare services, food, energy, portable drinkable, and social protection, among others. To prevail over these problems, political will is required to make significant institutional changes to show to the private sector that government is for every citizen and has zero consideration for status, whether affluent, poor, whether in the cities or rural areas.

2.7.2 Dimensions of Political Will

This study shall adopt a few dimensions to measure political will, as suggested by Treadway (2012). This includes instrumental, relational, felt needs, and accountability dimensions.

2.7.3 Political Commitment

According to Fox (2015), development of any kind is linked to the political willingness and commitment of leaders to apply their power, influence, and personal participation to ensure that programs and projects are accorded desirable attention to improve the living condition of the citizens. In the same vein, a study conducted on global health ‘effort’ reveals that the absence of political commitment has been recognized as a major

reason for the low precedence that food and nutrition interventions receive from national governments, especially in developing countries (Ashley 2015). Leadership commitment to society, personal actions, and conduct are basic requirements that propel stronger signals to the provision of infrastructural facilities to communities. A study reveals that political commitment is a vehicle for the fulfillment of obligations designed by the government to improve the condition of people (Fox, 2015).

According to Sabo (2015), connecting rural communities with internet services and electricity in Nigeria call for resilient political will and commitment, resources, and technology. Oyedele (2012) opines that efficiency and public management in both public and private organizations are contingent on political commitment. The author argues that such commitment is lacking in our public institutions and, therefore, a major factor that contributed to the failure of government policies and programs.

2.7.4 Political Obligation

As discussed earlier, political obligations are focused on the moral duties of political office holders to comply with the laws of their country and perform their legitimate political assignments according to the established law. According to Pateman (2010), political obligation is about the ethical duty to fulfill the regulations of one's nation or state or actualize campaign promises. This is the obligation of citizens' representatives to conform with the state's authority. Though both the authorized and political responsibility relates to such a duty, the legal obligation is based on the law. Hence, a government can only act because the law permits such action (Pateman, 2010).

This study considers political obligation synonymous with the fulfillment of political promises. In other words, political obligation is to have a moral responsibility to the politicians to strictly comply with the laws of one's country or state by fulfilling their pledges to the citizens. For political obligations to be effective, it requires the application of ethical principles (Gilbert, 2006).

2.7.5 Identification of Felt needs

Felt needs are an essential concept of political will in the study of RD. Felt needs, as used in RD, are the people's opinions on their community demands (Wade, 2010). In other words, felt needs are conceivable changes considered necessary by the community to correct the deficiencies identified in their community. In a study conducted by John (2011), the application of felt needs in rural areas is one of the indicators of RD. This includes discovering needs, ranking their value, and structuring programs based on the ranking by the beneficiaries. It is important to note that felt needs emphasize problem-solving to reduce professed socio-economic challenges among the rural dwellers.

According to Ekeh (2015), the essential goal is not only changed, but the government should have the political will to allow people to identify their needs. After that, the government will approve the project or infrastructure facilities. Felt the need to recognize the past problems as noticeable in the present. Therefore, relating the present

to the past, a development process based on felt needs results in having a future that is like the past, minus the problems (John, 2011).

2.7.6 Instrumental

As the name suggests, instrumental in this study means active involvement in accomplishing a task. To accomplish RD, a political actor must be politically active, influential, and involved in a major decision that affects constituent units under his watch. Addressing societal problems calls for collective action and harmonized commitment of the stakeholders and the people they represent. The individuals affected mainly by social problems generally are the weak or powerless. Thus, they deserve genuine representation in the arena of power to make life meaningful. To this end, Fischer (2010) opines that the alliance of stakeholders with the target beneficiaries of a policy must make solid commitments if conditions are to get better for the downtrodden in those areas. Also, Little (2010) argues that service renders the powerless and resource-deprived people sacrifices for others in a society, even when social interdependence state that sustainable longer-run solutions are 'win-win' for most or all.

Umar (2011) contends that the concerted effort of stakeholders of like-minded identifying problems and solutions such as poverty, provision of infrastructural facilities, and improvement of the well-being of the citizens, among several others, is an instrument of political will. Political will concerns the conditions, information, and activities of followership, particularly those in rural areas. These activities call for

periodic assessment, monitoring, and evaluation. In other words, the instrumental dimension is a holistic focus on the demands of common people.

2.7.7 Relational

As the name implies, it is how two or more people are related. Political will is a relational notion that can be understood through interaction between individuals and groups. McClurg and Younger (2010) contend that this combined thought on political will at its very nucleus is relational. In other words, if stakeholders of an organization exercise power, such can be examined on how it affects target beneficiaries in the society. Political will describes the evolution of relationships along political boundaries and the implications of the relationships on the individual targeted in the decisions. Younger (2010) argues that the most intellectual developments in the political class are established on central beliefs that political resolution is based on self-interest since its major actors operate independently of each other.

Consequently, this negates the idea of relational influence. As characteristically formulated by Dahl (1969), political will is Mr. A assigns Mr. B to carry out an assignment that would not otherwise carry out by them. It is obvious from this explanation that power is relational, meaning that political power only survives when considering interactions between and among individuals and groups.

Treadway (2012) argued further that the instrumental and relational dimensions were exaggerated by divergent forces that reflect the focal point of the actor's concern in a

given circumstance; as a result, within the gamut, the author identified that the dimensions of concern for self-individual and concern for others oppose for motivational focus. By implication, stakeholders showing a high degree of concern for self are busy with personal achievements that Strengthen and develop their sense of self.

Accountability denotes accepting liability for an action. Accountability is one of the elements of political will anchored on good governance. It is a proactive course in which public officials inform and defend their actions on their assigned tasks (Ackerman, 2005). According to Omotosho (2014), it is a constitutional responsibility for the public servants to be periodically accountable and transparent for their legitimate duties. Accountability is fundamental in public and private organizations as it strengthens trust, implementation of political will, and practice of good governance, and above all, mechanisms that assist politicians in fulfilling their campaign promises (Petra et al., 2016).

Femi (2014) noted that government non-charlatan attitudes increase low public trust and corruption levels. That is why the Lack of transparency and poor participation of citizens in the governing process got its root in an inadequate political will. Developed countries like the USA, Japan, the UK, and Europe attain their respective socio-economic and political statuses because of sincere political will and strict adherence to their political agenda (Umar, 2010). Globally, it is acknowledged that selecting suitable economic and social policies is only a fractional battle in the struggle for infrastructural development. Implementing the policy and sincerely accounting for the

resources allocated for the policy or programs is the most challenging. In Bedi et al., (2011) opinion, accountability should be downwardly institutionalized where governments are answerable to the public and equally, the public, in turn, holds government officials accountable. In the same way, Ogunleye (2010) sees improved integrity and accountability as a basic foundation for government at all levels to facilitate RD.

2.8 The Concept of Governance and Good Governance

Infrastructure is the backbone of economic capability, but it also directly influences human development, social inclusion, and environmental sustainability, which is why infrastructure development is a top priority for governments and individuals alike. This is true regardless of a country's stage of development or the prevalent economic culture and practice. The term governance entails the steering of a country towards the understanding of societal goals. On the other hand, governance implies the decision-making process and its implementation or non-implementation (Adejumobi, 2006). refer to the procedure and institutions where decisions and authority are made and exercised (MucuNigeruzi, 2011). Governance is exercising authority for the common benefit through official and informal methods (Daniel, 2003). Corporate, municipal, national, or international governance is all possible.

Among its key qualities are participations, consensus-building, accountability, transparency, responsiveness, effectiveness and efficiencies, the rule of law, equities, and inclusion (Zenger, 2010). The term "governance" can refer to either excellent or

bad governance; hence, it encapsulates the contrast between the stages of development of various countries around the world. Governance encompasses the decision-making process and the method through which choices are executed by the government or another entity (Mucuruzi, 2011). Governance has captured the attention of researchers and officials as they examine the difficulties of poverty eradication and hunger. For example, Kofi Anan noted in 1998 that excellent governance is arguably the most critical aspect of every country must have to eradicate poverty and promote prosperity (UN, 1998).

According to Abdulkadir, Jayum, and Zaid (2012), good governance entails the efficacy with which the government conducts its operations and promotes the public welfare. Under good governance, the government structures its programs to address the country's fundamental challenges, particularly those that directly affect the poor, such as poverty. On this basis, the government system is built to promote citizen engagement in decision-making, accountability, and citizenship rights in all economic, political, and socio-economic areas, respectively (Anyia, 2001). Good governance necessitates the enhancement of all parts of society, including institutional rules and the interplay of the economic and political systems.

As a confirmation of the above argument, scholars like Anyia (2001) and Aryeetey et al., (2012). Zaid (2012), Bezold, et al., (2009), Gul et al., (2012), Murega (2014), and Lusk (2010) assert that excellent governance predetermines the totality of human growth. This is accomplished by reducing poverty in productive work and integrating

taxpayers, particularly the poor, with social activities and policies that directly link to what they need. As reiterated by Mughal (2012), Azam and Emirullah (2014) are of the view that the quality of governance consequence in sustainable growth and poverty alleviation, notably in Asia, Africa, and Latin America's growing economies.

Concerning the critical nature of good governance, the African Union (AU) developed the New Partnership for Africa's development, 'NEPAD, aimed at Improving good governance as a necessary condition for the African continent's development (Anya 2001). Lyakurwa (2009) stated that effective governance promotes resilient, pro-poor growth, hence promoting peace, political engagement, social empowerment, and the developmental aspect of any nation. Again, Anya(2001) noticed that successful poverty eradication in Africa is hampered by a lack of Stronger governance (Nigeria and Niger inclusive). Thus, to address the issue of poverty in Africa, the author emphasized the need to embrace democratic ideals, prioritize security, emphasize economic growth, and zero tolerance for corruption, to name a few. This assertion was confirmed further by (Craig & Porter, 2006).

The idea of governance encompasses how humankind or the broader community organizes and collaboratively handles its affairs. Global governance is an addendum to this worldview. Additionally, it includes the formal decision-making processes of any nation, as well as numerous processes that shape how we collectively address global issues of concern, such as financial stability or instability, environmental sustainability, peacekeeping and security, human rights, and trafficking, among others

(Bolton, 2000; Diwerth & Pattberg, 2006; Frenk & Moon, 2013; Thomas, 2000). Similarly, Adejumobi (2006) demonstrated that the right to choose the economic policies and agendas that each nation would follow without foreign involvement or imposition of market ideology that would assist poverty reduction is possible through efficient governance.

In line with the positions of the above authors, political pundits observed that Nigeria is seriously confronted with the challenges of good governance. This can be justified by the apparent unwillingness of leaders to conduct the principle of equity, justice, fairness, judicious utilization of public resources, and above all, consideration for the interest of the commoners. Furthermore, Nigeria as a country is perceived as a victim of advanced corruption, political volatility, poor governance, and a recurring legitimacy crisis. Hence, national development is stunted, and the political atmosphere is indeterminable. The country's dictatorial leadership is confronted with serious political conspiracies in a culturally discriminated society. Circumstances where the ethnic struggle for resources drove much of the persistent corruption and wastefulness, while the political gladiators relentlessly influenced the people's choices and decisions as well as the political processes to attain their self-seeking agenda, the society remained bankrupt, and the people continued to stumble in abject poverty (Omololu, 2007).

Another study conducted on good governance in the Philippines recognizes that applying good governance improves the formulation of programs and makes the

implementation strategies tolerable to the organized stakeholders and individual target beneficiaries (Balisacan, 2003, 2007, 2010; Moreno, 2004; Reid, 2005). Also, improve the administrative ability to be effective and responsive to the distinctive circumstances surrounding poverty, the credit needs of the poor people, and the financial capabilities of the deprived target beneficiaries. On the other hand, scholars contend that the domineering of political and economic forces, coupled with the elitist orientation of both technocrats and bureaucrats with their close association with the local elites, made the practice of good governance very cumbersome in the developing world like Nigeria (Awojobi, 2011; Mashreque, 2012; Saeed, Lodhi, & Saeed, 2013).

Accordingly, the fall-out of poor infrastructure and poverty circled the crisis in a weak state capacity and structure, which specifically pinned on the system of poor governance (Fritz & Menocal, 2007). In a brainstorming forum at Dhaka, it was confirmed that the objectives of infrastructure development and poverty eradication in Bangladesh are in the right direction because poverty in the country is a result of massive corruption, provoking politics, poor governance, infrastructural challenges, poor implementation of policies and programs and host of other factors (Duit & Galaz, 2008; Sarker & Rahman, 2007). The perception of good governance is very important in all aspects of life and is beyond the essentials of good economic policies. Although good governance depends on the good institution and in some situations, good governance can be achieved through decentralized and participatory approaches (Agrawal, 2001; Andrew, 2008; Boas & McNeill, 2004; René, Saeed, & Robert, 2005; Reid Dorraine, 2011; Kartik & Tisdell, 1998).

2.8 1 Essential Elements of Governance

The World Bank (2014) recognized six indicators of governance. This includes voice and accountability, the rule of law, political stability, absence of violence, government effectiveness, regulatory quality, and control of corruption (Daniel, 2003). In a study, MucuNigeruzi (2011) infers that good governance has eight major features. It is participatory, consent oriented, accountable, transparent, effective, responsive, efficient, inclusive, equitable, and above all, this is in line with the rule of law. Good governance guarantees that corruption is abridged, the views of minorities are considered, and that the voices of the weakest, helpless, hopeless, voiceless, and visionless in the society are taken into cognizance during the decision-making. Besides, it is also about responsiveness to the present and future demands of the people and the society in general.

Considering the importance of governance, international institutions like World Bank and UNDP have committed themselves to encouraging good governance and the rule of law. The UNDP particularly recognizes the relationship between social and political spheres, hence actively involved in instituting democracy, public participation in policy formulation and implementation, and transparency, as well as combating corruption, improving human rights, raising accountability and efficiency of public organizations, and making the legal structure handier to the disadvantaged and ordinary people (Sharmila, 2013). On the other hand, Iacobuta and Pohoata (2009) uphold that making new rules and regulations is pointless if they are not adhered to.

Therefore, good governance can only be encouraged by instituting the rule of law and empowering the judiciary to discharge their duties as enshrined in law books. We shall narrow our explanation to few indicators that are only relevant to this study.

2.8.2 Accountability

Accountability entails responsibility for an action, sanctions where clarification or justification for an action is insufficient, the ability to withdraw or annul a mandate, public investigation of government actions, and citizen participation in government policies and programs, among many others (Ma, 2009; Premchand, 1999). In precise views, accountability is one of the elements of governance and is a proactive course that public officials notify and justify their actions on the responsibilities assigned to them (Ackerman, 2005). It is globally recognized that choosing the appropriate economic and social policies is only a partial battle in the struggle for poverty alleviation. Hence, scholars suggested that accountability should be downwardly institutionalized. In downward accountability systems, governments, to some extent, feel they are answerable to the public to attain poverty reduction, and equally, the public, in turn, holds government officials accountable for accomplishing these results (Bedi & de JoNiger, 2011; José, 2007).

In a similar development, Ogunleye (2010) perceived enhanced probity and accountability as one of the steps the government at all levels would facilitate poverty alleviation in Nigeria. This can be easily accomplished only if the government is made to be more accountable to the people, and conversely, the citizen is also answerable to the government.

2.8.3 Rule of law

This indicator contains insights about the power and authorities of law enforcement agencies like courts of law and the police and measures sensitivities on the degree of confidence that the public has in the societal laws and the extent to which these rules are strictly followed (Sharmila, 2013; Van Hüllen, 2012). The rule of law measures the threshold that citizen has self-confidence in complying with the guiding rules of a state, putting into cognizance the worthiness of policy formulation and implementation. Evident here is that the past poverty alleviation programs have failed due to politics of personal rule where leaders claimed to be above the law. In this unchallenged and exploitative politics, there is little or no time for the common people as regards their basic needs. Ultimately, the program's beneficiaries or policies (Poverty Alleviation Program) are the same big bourgeoisie in the political arena. This is because the rule of law only applies to the common people (Maduagwu, 2000).

Maduagwu (2000) further opined that the rule of law is the principal determinant of economic growth and development. It does not only ensure life and self-security but also offers a steady agenda of rights and responsibilities that aid in reducing poverty. Poor application of the rule of law not only drives away foreign trade but also hampers domestic businesses and, consequently proliferation of poverty. Finally, an empirical study reveals a significant contribution of good governance as a moderator between Agricultural Intervention Programs (AIPs), participation in policy, and Poverty alleviation in the State rural areas (Idris, 2017). This justifies the introduction of good

governance as a mediator with infrastructural development in rural areas of Niger (Baron & Kenny, 1986).

Agents faith in and compliance with social standards, including the quality of contract enforcement, the police, and the courts, and the risk of crime and violence

2.8.4 Good Governance and Dimensions

Good Governance is the proper and prudent management and direction of state affairs. Using the instrument of state for decision making, implementation, and enforcement through purposeful result-oriented state policies and programs, articulated strategies for check and balance. This will help to combat corruption and ensure accountability, proper budgeting, and expenditure of public revenue (Idris, 2017; & Adamu, 2016).

According to World Bank (2014), governance refers to both traditional and institutional ways of exercising governmental authority. Furthermore, governance involves all the processes by which governments are selected, monitored, and replaced; the capacity of the government to effectively formulate and implement sound policies; and the respect of citizens and the state for the institutions that govern economic and social interactions among them (Kaufmann et al. 2010). The following aspects of good governance are discussed below”.

2.8.5 Voice and Accountability

The amount to which a country's residents can vote for their government and their freedom of expression, association, and access to a free press.

2.8.6 Political Stability and Absence of Violence

Perceptions of the possibility of the government being destabilized or toppled by unlawful or violent tactics, such as domestic violence or terrorism (MucuNigerzi, 2011).

2.8.7 Government Effectiveness

The quality of public services, the civil service quality, and degree of independence from political influences, the quality of policy development and execution, and the government's commitment to such policies' credibility (Mucungzi, et., al).

2.8.8 Regulatory Quality and Control

The government's capacity to establish and implement appropriate rules and regulations that allow for and support private sector development.

2.8.9 Rule of Law

Agents' faith in and compliance with social standards, including the quality of contract enforcement, the police and the courts, and the risk of crime and violence.

2.8.10 Control of Corruption

The amount to which public authority is used for personal benefit encompasses both small-scale and large-scale corruption and state capture by elites and private interests (Ott, 2011).

2.9 Underpinning Theory

In the context of this study, System Theory is adapted as an underpinning theory to examine the impact of Electricity Infrastructure on Rural Development, its benefits, and improve the living condition of the rural people. At the same time, Empowerment Theory would play a complementary role in supporting the system theory. These Theories serve as a trajectory and feasible model to predict the result of the study.

2.9.1 System Theory

The word ‘systems’ entails techniques of analysis that are adapted to sorting out complexities. A system consists of four basic things. This includes objects – the parts, elements, or variables within the system. These could be physical, abstract, or both, depending on the nature of the system. Also, a system contains an element, by implication, qualities or properties of the system and its objects. Thirdly, a system has internal relationships among its objects, and systems exist in an environment (Ramage & Shipp, 2009).

A system, therefore, is a set of things that influence one another within an environment and make up a larger or more significant pattern distinct from any of the parts. The primary systems-interactive model of an organizational analysis shows the frequent

stages of input, processing, and output, which express the concept of openness/closeness. A closed system does not interrelate with its environment. It does not receive information; hence, it is likely to disintegrate. On the other hand, an open system receives information, which it uses to interact vibrantly with its environment (Bryant, 2011; Joseph, 2013).

A system is concerned with the network of relations that upholds a holistic view of an organization rather than its constituent part. General Systems Theory has gained a broader recognition due to the inadequacies of conventional structured, closed system models over the past periods. Consequently, incorporating general systems theory has offered many promising visions that would allow better organizational models and behaviour studies to be carried out. The theory offers an analytical framework to perceive an organization in general as an organism that recognizes the interdependence of personnel, the impact of the environment on organizational structure and function, and the effect of stakeholders in the organization. The system recognizes the significance of focusing on the environment and how changes can impact the organization (Easton, 1967).

2.9.2 Assumption of System Theory

Dent et al. (2013) identified the following fundamental assumptions of systems theory

2.9.2.1 Holism

Holism refers to the assumption that an entity or organization can be best understood by considering the totality of the organization. The entity/organization has some

features which belong to the system as a whole and do not belong to any of its parts. In other holism is an approach that focuses on the whole rather than its parts, where the whole is superior to the sum of its constituent parts.

2.9.2.2 Relationships

Another fundamental assumption of the theory is that the unit of analysis should be affiliations or relationships rather than entities. By implication, entities only take one meaning if they are in contact with each other. An advocate of this assumption contended that "relationships should be used as a foundation for all definitions and should be instilled to all members of the organization. Alternatively, the unit of analysis is an entity that sees the world as a different entity than themselves and is a productive object of study. It is instrumental to understanding the basic phenomena of the organization.

The Underpinning theory has input, process, and output, which serve as a guiding principles. The theory provides a basis for generating relevant information about EI to enable us to ascertain its impact on RD. The theory clarifies the relationship between the causes and effects of EI on the observed outcome of RD will be achieved or otherwise. For instance, the first element of this theory, "Input," represents EI as an approach introduced by the government to enhance RD the feasibility of EI (success or failure) is directly linked to the next element of the theory, known as the "Process" Which is represented by political terminology referred to as political will. This is the willingness of the political actors to execute policies and programs to improve the

living conditions of the citizens. A process is about the involvement and interaction of the rural beneficiaries on the policy agenda of electricity production, transmission, and distribution.

Political will is a “moderating variable” because of its harmonizing function in consolidating the EI to achieve the envisioned goals of the study (RD) or otherwise. By and large, politics will seemingly strengthen and achieve RD if effectively implemented and vice versa.

2.9.2.3 Environment

Similarly, the theory assumes that the environment plays a significant role in identifying a phenomenon. The environment is fundamental to understanding the system theory as it guides the explanation of the relationships between the set of objects and their environments. The human body and solar system are good examples of a system as it illuminates processes and how the organization affects and is affected by its environment. The organization demarcate the physical, social, emotional, and scope of work that set it apart from its environment must be semi-permeable and constricted enough to focus the organization's energy on achieving its objectives. The boundary's quality of penetrability makes it It is easy for the organizational system to get feedback from its environment and use it to develop the organization (Dent et al., 2013).

2.9.2.4 Indeterminism

Indeterminism supposes that sometimes it is naturally impossible to decide the direction of an anticipated change in advance. A good example is the expectation of instant change and development in Nigeria from the present government of President Muhammad Buhari. However, conclusions can be predicted from a set of identified variables under study.

2.9.2.5 Causality

The theory assumes that in every problem, there must be cause and effect. The mainstream scholars on the subject matter of cause and effect proposed three requirements - association, the direction of influence, and non-spuriousness - which are necessary (but not adequate) to determine causation

2.9.2.6 Self-organization

The philosophical assumption of this theory's self-organisation is the idea that the elements of a system move to their steady equilibrium states mostly independently and that one or a small number of causes affect the elements of a system in its entirety. Self-organization also refers to spontaneous order in the social sciences, which is a procedure where general order rises from local interactions between parts of an initially disordered system. The process of self-organization is not necessarily regulated by any supplementary agent outside the system.

2.9.2.7 Observation

A fundamental belief underlying conventional science was that observations are independent of the observer's characteristics. Neutrality was possible if one assumed that different persons looking at the identical phenomenon in the same way, would generate a similar explanation. By and large, observers have direct access only to their knowledge, skill, and experience, and a "reality" is fashioned based on the things they observe. Hence, constructivists stress perception, conversation, and reality construction, and realists assume that descriptions can be correct pictures of an external world.

2.9.2.8 Reflexivity

Reflexivity denotes cyclical relationships between cause and effect. A reflexive relationship is mainly bidirectional, with both the cause and the effect affecting one another in a relationship that neither can be blamed as causes or effects. In social science (sociology), reflexivity refers to an act of self-reference where investigation or action "bends back on," refers to, and shakes the entity prompting the action or investigation. In addition, reflexivity is the ability of a manager to recognize forces of socialization to modify their place in the social structure. Poor reflexivity would result in an individual fashioned largely by their environment. Conversely, a high level of social reflexivity would be well-defined by an individual modelling their principles, perceptions, politics, desires, and many more.

In this study, System Theory is seen as a framework; thus, the researcher intends to evaluate the relationship between electricity infrastructure (EI), which represents the "input," political will (PW) as the "process," while good governance (GG) is the

intervening variable that strengthens the relationship between the political will and rural development RD, which is the “output” By implication, the study intends to examine the performances of the four variables jointly to ascertain their effects on the people of rural areas in Niger State. The theory is seen as an organism that recognizes the interdependent services of its constituent units in its entirety. Thus, the failure of one unit affects the entire unit.

Easton et al. (1967) advocated that system theory is better operated in an equilibrium environment, organization, society, or state, a stable structure that allows the flow of activities in their right perspectives of a constitutionally agreed process. However, in the scope of this study, Niger State rural areas and some African countries are not perfect societies. They are characterized by systemic failure (ref). Secondly, the system theory also ignored empowering the rural people (ref). Empowerment is key to national and RD, and we cannot speak of development without economic and educational empowerment. These weaken the theory, and hence mandated the introduction of empowerment theory.

2.9.3 Empowerment theory

Empowerment is the enabling environment for poor people to have assets and the ability to participate, negotiate with, influence, control, and hold accountable institutions that would impact their lives (World Bank, 2002). participate in negotiating with, influence, control, and hold accountable institutions that affect their life (World Bank, 2002). Important to note is that empowerment is a multidimensional

concept used in various fields of study like political science, sociology, economics, etc. To explore how empowerment can help to reduce poverty and improve the wellbeing of Rural dwellers. (The World Development Report 2001; World Bank 2001 & Grootaert et al., 2013). Usually used would be looked into (The World Development Report 2001; World Bank 2001 & Grootaert et al., 2013).

Another study by Sara et al., (1990) Developed the women's empowerment Framework, recognized as the Longwe Framework, in Lusaka Zambia. Longwe (1990) added that no nation in the world could move on the path of development if her youth, women, and rural people were not considered in the country's national development plan. As a consultant on gender issues and a development advocate (Lingerie et al., 1990) open that youth and women should be participatory in the decision-Making process to promote development. Her study positively impacted women, youths, and rural people. The study attracted the attention and support of governments at all levels in most African countries.

2.9.4 Empowerment Theory and its Dimensions

The World Bank, in its usual ways to improve the lives of rural dwellers, came up with three basic standards to be meant as a yardstick for empowering the rural people. They are called The Three Pillars of Empowerment, World Bank 2001. (Grootaert et al., 2003).

- 1) Making institutions more responsive to the rural poor; in the areas of opportunity for participation by the rural poor.
- 2) Removing social barriers allows inclusiveness in governance and gender-sensitive participation and appointments into political offices.
- 3) Building social institutions and social capital; in the areas of improving infrastructures, electricity, in particular, would enable other infrastructures to stand, and these would improve their quality of life and basic education that will ensure human capital development (Grootaert, 2003; Douglas & Mare 1995; Pennie, Deborah, Susan, Rey & Courtney 1998).

2.10 Chapter Summary

Reviewed literature indicates that the misery of development in rural areas of the developing world is linked to poor EI. Several authors argued that developing countries were endowed with rich resources to attain sustainable development. However, the absence of a political will is among other factors responsible for the failure of most programs in the Sub-Saharan region of Africa and Nigeria in particular. Considering the fact that the Nigerian government has spent significant resources on electricity infrastructure and the desire to compete with the globe effectively, there is an ardent need to evaluate the performance of electricity infrastructure and its contribution to rural development

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter adopts research instruments such as research paradigm, population, sampling framework, and size. The study shall further clarify the instruments for the quantitative and qualitative method under instrumentation and correspondingly explain the procedures of data collection through the adapted instruments as well as the measurement of variables in conducting a pilot study to determine the authenticity and reliability of our data.

3.2 Research Paradigm

A paradigm is an assumption about how things work. A paradigm denotes a model, a pattern, or a standard. It refers to how research could be affected and guided by a certain idea. (Flick, 2015). Paradigms are systems of beliefs and practices that standardize inquiry within a specific field of endeavour by providing guidelines and processes through which a study is achieved.

Similarly, a research paradigm is recognized as a research idea, as a major belief system that guide researchers on a particular study (Gilbert, 2015). The research paradigm is essentially characterized into a positivist paradigm and an interpretive

paradigm (Eriksson & Kovalainen, 2015). The positivist paradigm is a scientific paradigm and is a hypothetical contribution of a renowned French theorist Auguste Comte (1798–1857) (Brennen, 2012; Lindsay, 2010). The positivism norm has internationally gained acceptance, therefore, is a main research paradigm used by social scientists (Koronowski et al., 2015). Positivists maintained that social reality could independently be studied, deprived of intrusion or prejudice from the researcher. Positivists also concur that social life can equally be symbolized in quantitative form with the application of correlation and experimentation to decide the cause-and-effect relationships between two variables (Creswell, 2013). This study applies the pragmatism research paradigm. Pragmatic denotes a word that defines a philosophy of doing what works best. Pragmatism is not committed to any one system of philosophy and reality. This applies to mixed methods research in that inquirers draw liberally from both quantitative and qualitative assumptions engaged in their research. Pragmatism is important in this study because it allows the researcher to be problem-centered or focus on the research problems and use all approaches obtainable to comprehend the problem. Pragmatism gives room for multiple methods, diverse worldviews, and different assumptions, vis-a-vis different procedures of data collection and analysis respectively (Creswell, 2013). This study utilizes pragmatism because the population is larger and involves more than 300 sample size. Pragmatism can help researcher to validate sample size through quantitative approach.

3.3 Research Design

Research design covers the entire phases of a study and a master plan demonstrating the styles and processes for collecting and analyzing data of the study. Research design shows the methods of data collection, interpretation, and analysis or methodical process covering a sequence of guides for the collection of data (Chinomona, Maziriri, & Moloi, 2014).

This is basic research aimed at exploring the state of affairs regarding Electricity Infrastructure, Rural Development, political will, and good governance in Niger State rural areas from 1999-2015. The study adopts mixed methods in assessing the impact of power supply on the development of the rural areas and the roles that political will and good governance played in intervening in the relationship in Niger State rural electrification. Also, this method would assist the researcher in distinctly collecting both qualitative and quantitative data, independently report the result, and adopt the embedded method to analyze the data. Mixed methods design allows one form of data collection to reinforce and offset the defect of the other method. Therefore, it's an all-inclusive and exhaustive method (Creswell, 2012). In addition, Kura and Sulaiman (2012) consider the adoption of qualitative as well as quantitative research makes the researcher find out a major lacuna of the phenomenon under study. Mixed-methods research is divided into two types: sequential and concurrent. This study shall adopt sequential mixed-methods designs, where the researcher conducts one element of the study (quantitative) first and then the other component of the study (qualitative)

(Venkatesh, Brown, & Sullivan, 2016). By implication, the mixed method plays complementary roles and increases the study's sample size (Creswell, 2013).

This study uses primary and secondary methods to collect data from the study area. Quantitative techniques provide realities that can be pooled together, scrutinized, and described to predict their existing connections. Whereas qualitative research help to explore and describe the relationships and to illuminate associated differences in the quality of those relations (Venkatesh et al., 2016). The survey method was used via self-administered questionnaires to allow the researcher to determine the opinions, attitudes, and features of rural dwellers on the impact of EI (Alhassan & Adamu, 2014; Creswell, 2013; Venkatesh, Brown, & Bala, 2013). Survey systems shall aid researchers in categorizing and spell out the current position of the respondents.

The qualitative technique was adopted using an interview as the second phase in the sequence to guide the researcher to explain further the effects of quantitative results from the first stage. Qualitative data collection builds directly on the quantitative result that shows extreme or outlier cases, significant predictors, significant results relating to variables, insignificant results, as well as demographics. The second qualitative section supports the strength or exposes the weakness of the first quantitative method. Therefore, the two methods were interconnected to generalize the result. Quantitative data is important because it provides a broader or more detailed understanding of the research problems (Brunsdon, 2015). Qualitative data analysis enhanced and explained

the quantitative results obtained from the respondents in a more detailed manner (Creswell, 2013; Tashakkori & Teddlie, 2010).

Similarly, this study is cross-sectional in nature, where data shall be collected at one point (Neuman, 2006; Sekaran & Bougie, 2014). The researcher's choice of cross-sectional study over the Longitudinal method is to evade talk over any issue outside the scope of the study, particularly since the study is concerned with the short term objectives of EI in the rural areas of Niger. The population and sample of the twenty-five local government is represented below in Table 3.1 according to senatorial zones.

Table 3.1
Niger State Local Government Councils, according to senatorial zones

S/NO	Zone A	Zone B	Zone C
1	Agaie	Bosso	Agwara
2	Edati	Chanchaga	Borgu
3	Bida	Gurara	Kontogora
4	Lavun	Suleja	Magama
5	Lapai	Rafi	Mariga
6	Katcha	Shiroro	Wushishi
7	Gbako	Tafa	Rijau
8	Mokwa	Paikoro	Mashegu
9		Munyan	

Source: Niger State Government, (2011)

3.4 Population and Sample

A population is a collection of individuals or objects with common elements (Creswell, 2012; Sekaran & Bougie, 2014). The population of the study areas is the twenty-five local governments that were approved in the amended 1999 Constitution of the Federal Republic of Nigeria (FGN). This includes the newly created Local Governments Areas (LGA) that were later converted to Development Areas (DA) as a result of the

inconsistent constitutional clause, which empowers the state governments to create new local government areas without financial autonomy to the state governments (Okafor, 2012).

Accordingly, Niger State has a projected population of 3,954,722 (National Population Commission, 2015). Twelve Local Governments Areas (LGAs) were selected to represent all the senatorial zones in the State (Zone A, B, and C). In each of the Local Governments Areas, three rural communities were selected. The sample is selected to fulfil the selection model for the sampling of the study. Niger State was chosen due to the paucity of studies on the subject matter. Figure 3.1 shows the nature of the multi-stage sampling technique of the study area from the state level, through the ministry, the senatorial zones, and the number of Local governments from each zone and the proposed 4 local government areas and rural communities, respectively. Multi-stage sampling technique is chosen in a serial phase to achieve a preferred sample size (Hair et al., 2011).

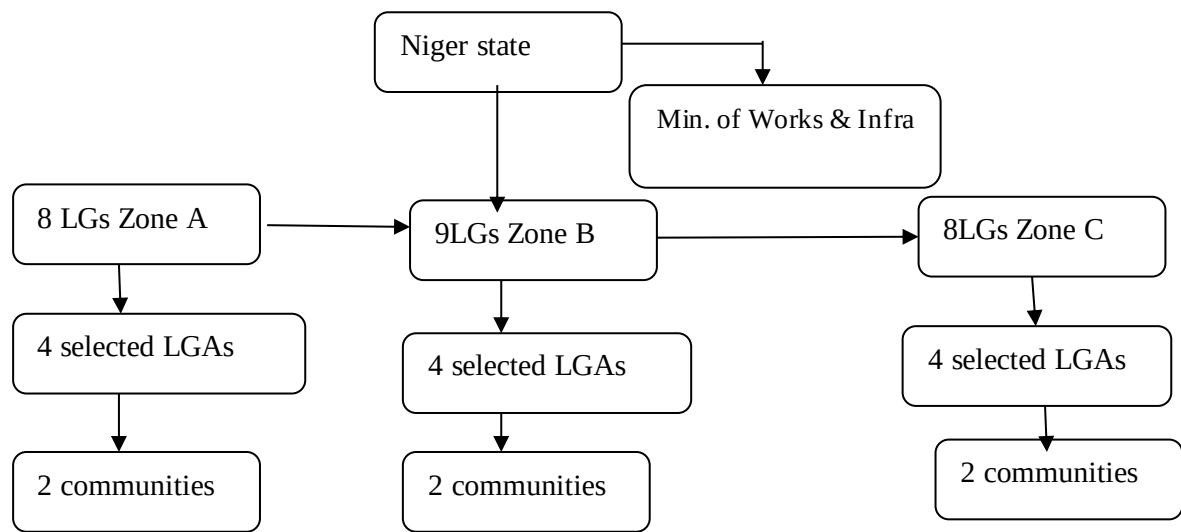


Figure 3.1
Chart Showing The Compass Of The Study Area

3.4.1 Sample Size

A sample is a set of individuals or participants selected from a larger population for a study (Creswell, 2013). A reasonable sample is significant for reducing a high degree of sampling error, so this indicates the need for choosing an appropriate sample size. Salkind (2006) contends an appropriate sample size is indispensable for any research because, too small a sample size is not a good representative of the population as it may lead to Type 1 error. The need for sample size is tasking and also a major part of any research in social sciences. It determines the accuracy and consistency of the study (Cohen, Manion, & Morrison, 2013).

Considering the size of Niger State, which is the second largest in land mass in Nigeria, coupled with the scarcity of resources and limited time frame for the study, it will be difficult to cover the whole state, and this, therefore, necessitates the researcher to narrow the study to twenty-four rural communities in twelve Local Governments to

represent the rural areas across the three senatorial districts of Niger State. The individual households that are the electricity consumer are considered as a unit of analysis in this study. There are several methods to determine sample size, and this study adopts the Krejcie and Morgan(1970) schedule table as indicated. Hence, from the population of 1799 rural people, this study sample the opinion of 317 respondents. The sample size of this research is in connection with the assumption of (Roscoe, 1975). The author averred that a study with a small sample size could reduce the chance of evaluating the true effect of a phenomenon and vice-versa.

In some circumstances, researchers dispatch questionnaires through post offices may lead to a low Questionnaire Return Rate (QRR). In order to complement the anticipated mail lost and uncooperative support, Salkind (2012) vouch for an upward review of sample size by 40 percent or 50 percent. On this note, the sample size is reviewed upward from 317 to 444, which represents a 40 percent increase as suggested.

3.5 Sampling Framework and Techniques

The term sampling framework denotes the total list of the entire sample units, in other words, the whole or complete members of the population where the study sample has been selected (Creswell, 2013). The sampling framework for this study covers electricity consumers in the rural areas of Niger State.

In a similar development, the study limits itself to a probability sampling technique which allows each item of the population the equal opportunity of being chosen as a

sample to lessen the high rate of bias. The study precisely adopted a multi-stage sampling technique, where Niger State shall be grouped into three senatorial districts (A, B, and C). Four Local Government Areas were chosen from the senatorial zones, and in each of the twelve Local Government Areas, an aggregate unit of two rural communities was randomly chosen to represent the population, and the questionnaire instrument were proportionally distributed (Sekaran & Roger, 2014). Multi-stage sampling technique is necessary based on the fact that rural areas in Niger State are enormously large. Therefore, it will be difficult to achieve a comprehensive list of the entire population (Creswell, 2012). Multi-stage cluster sampling is applicable because rural areas in Niger State are identical and equal societies and in some instance with common characteristics, attitudes, and behaviour with few infrastructural facilities (Muhammad, 2015). Table 3.2 shows the detailed population of the study area, which covers the selected local governments, and the rural communities, respectively.

Table 3.2
The population of The Study Area

	LGAs	Population of LG	Name of Rural Communities	Population of the communities (Household)
Zone A	Agaie	179,570	Nami	73
			Kusoyaba	82
	Lapai	148,792	Takuti	103
	Katcha	163,604	Lenfa	78
			Edota	73
Zone B	Lavun	154,879	Zhitu	78
			Doko	101
	Bosso	199,095	Vunchi	56
			Ungu Yashi	88
			Maikunkele	98
	Chanchaga	112,872	IjaGbayi	66

	Gurara	134,874	Ija Koro	56
			Gawu	67
	Paikoro	206,833	Lambata	73
			Takun Para	65
			Ra finJatau	56
Zone C	Borgu	146,657	Wawa	79
			Babana	76
	Wushishi	110,496	Wushishi	94
			Zungeru	61
	Mashegu	290,514	Mashegu	88
			U/Mallam	64
	Kontogora	205,290	Bangi	63
			Ibbi	61
Total				1799

Source: National Population Commission, (2015)

3.6 Instrumentation and Measurement

In order to generate sufficient data from the study areas, this study adopted sequential mixed method analysis, which comprises two different sections: quantitative and qualitative. In this circumstance, the researcher in this first collects and analyzes the quantitative data that is only numerical (Clark & Creswell, 2011). The qualitative (text) data was later collected and analyzed, establishing as the second in the sequence that guides the researcher to elaborate the effects of quantitative results from the first stage. The second qualitative section shapes the first quantitative segment. Therefore, the two phases were interconnected to make a generalization of the result. The reason for this is that the quantitative data and its subsequent analysis provide a broader and a more detailed understanding of the research problems (Brunsdon, 2015). Qualitative data analysis enhances and explains the quantitative results obtained from the respondents in a more detailed form (Creswell, 2013; Tashakkori & Teddlie, 2010).

A mixed methods approach is necessary because using only qualitative or quantitative methods might be deficient to best understand a research problem (Creswell, 2012). The combination of the methods is needed since one method does not agree with researchers to sufficiently address all aspects of research questions and objectives; hence, Using variations of methods might increase the validity of the study as one method serves as a check on the other (Venkatesh et al., 2013).

The quantitative method in this study apportioned the questionnaires into sections to cover issues on the socio-economic characteristics of the respondents, and the impact of electricity in rural areas. To this end, the study adopted a “before and after” method to enable us to appreciate the living standard of the rural people before the connection of their communities to the national grid (electricity). The Independent variable is EI, while political will and good governance are the intervening variables, the moderating and mediating variables, respectively, and the dependent variable is RD, whereas the demographic variable is independent variable. The questionnaire will consist of five sections, namely the demographic section, EI section, political will section, good governance, and RD section. Questions on the EI section, political will section, good governance, and RD section will contain system theory aspects such as focusing on objects, elements, environment, and the impact of changes on the rural communities. The demographic section will utilize nominal, ordinal, and ratio measurements.

For example, the questions may consist of gender, race, age, income, and occupation. The survey questionnaire is designed to have five options about EI, political will, and

good governance, and RD variables ranges from strongly disagree, disagree, neutral, agree, and strongly agree (given index – for example: 1. Strongly disagree, 2. Disagree, 3. Neutral. 4. Agree and 5. Strongly agree). Consequently, the Likert scale of 1–5 will be used to measure the Feelings of the respondents in the state's rural areas. The study will use an ordinal level of measurement (Merkie et al. 2014) to assess the impact of EI on RD and, on the other hand, to evaluate the relationship between EI and RD as a result of the introduction of political will and good governance, respectively, in the study.

3.6.1 Electricity Infrastructure

Electricity Infrastructure was measured with the following items as indicated.

Table 3.3 below

Table 3.3
Electricity Generation

S/NO	Items	Source
1.	Electricity supply is sufficient in my community	Ijewere, 2011
2.	Electricity is stable in my community	
3	We only enjoy electricity once a month	
4	Electricity staff check their facilities regularly	
5	Electricity authorities lack a maintenance culture	
6	Obsolete equipment contributes to power failure	
7	We frequently experience power failure	
8	Electricity personnel complains of inadequate funding.	
9	Frequent power failure affects our daily business	
10	Constant power failure affect our standard of living and the development of our community	
11	Poor power supply contributed to unemployment	

Source: Ijewere, 2011

Table 3.4

Electricity Transmission

S/NO	Items	Source
1	My community is connected to electricity	Meier. 2010, Bensch, 2011
2	There is regular electricity in my community	
3	There is high power voltage in my community	
4	I am self-employed as a result of the connection of our village to electricity.	
5	Electricity distribution staff attend to us when there are problems	
6	There is periodic electricity service in my village	
7	Electricity is used in farming activity	
8	My farm product has improved as a result of the electricity installation	
9	We can preserve our farm products with electricity	
10	Rural clinic/dispensary has benefitted from electricity	
11	There is electricity rationing in my community	
12	Insourced electricity supply from the government/institution (system theory)	

Source: (Bensch, Kluve, & Peters, 2011; Meier, Tuntivate, Barnes, Bogach, & Farchy, 2010)

3.6.2 Electricity Distribution

Table 3.5

Electricity Distribution

S/NO	Items	Source
1	We enjoy regular electricity like other villages	Ijewere, 2011
2.	The current electricity distribution impacted on me	
3.	The electricity distribution is adequate	
4	We pay our electricity bill regularly because electricity distribution is stable	
5	The electricity supplied is the same as the local government headquarters	
6	We pay different fixed tariffs because of poor electricity	

Source: Ijewere, 2011

3.6.3 Political Will

Political Will in this study refers to the commitment, promises, obligations, and ability of political office holders representing your constituency in the government to strengthen their set objectives and implement them accordingly. The following

questions in Table 3.5 below will help the researcher to know how political will strengthen the power supply in rural communities of Niger state.

Table 3.5

Political Will

S/N	Items	Source
1	The government set agenda for community development	(Betancourt & Sanguinety, 2008; Post, Raile, & Raile, 2010)
2	Activities of political leaders are transparent (Known to the citizens)	
3	Our community was promised to be connected to electricity during the campaign.	
4	Our community was connected to electricity after the election	
5	Our political representative helps solve our community problems (e.g., electricity).	
6	Political office holders fulfil their budgetary commitment	
7	Political office holders are major actors in solving electricity problems (Instrumental)	
8	We are satisfied with the electricity obligation of our political representatives	
9	Our political representatives have influential personalities to solve our electricity problems	UUM Universiti Utara Malaysia
10	Our political representatives consider the provision of electricity as an obligation	
11	Our political representatives are very competent (capability)	
12	Electricity is not imposed on us (It is our felt needs)	
13	There is awareness on electricity activities through meetings (Accountability)	
14	Political representatives occasionally visit us to find out about our electricity problems (Relational)	

Source: (Betancourt & Sanguinety, 2008; Post et al., 2010)

3.6.4 Good Governance

Table 3.7
Good Governance

S/N	Items	Source
1	There is a clear mission statement and action plan on electricity in Niger State (Electricity for all)	
2	The provision of electricity is a political priority in Niger State (Felt need of the electorate)	
3	The government accepts electricity needs identified by the rural people	
4	Government does not discriminate against the nomination of participants in electricity matters.	
5	Government implements the view of the rural people on electricity matters	
6	There is policy continuity on electricity affairs in Niger State	
7	Elected politicians account for their achievements on electricity from time to time (Accountability)	
8	Steady electricity was based on government commitment	
9	Policy making on electricity was based on the experience of rural electrification problems	
10	Defaulters of electricity bills are punished accordingly without discrimination	
11	Political representatives are proactive in identifying potential problems that may disrupt electricity in my community	
12	Electricity beneficiaries hold politician accountable for the failure of electricity	
13	Government exhibited good governance mechanisms in policy implementation	
14	Electricity budget fully implemented	
15	Politicians are held very accountable for the failure of electricity in my community	

Source: (Betancourt & Sanguinety, 2008; Post et al., 2010)

3.6.5 Rural Development

This study's rural development is a course of improving the quality of life and socio economic well-being of people living in relatively isolated and sparsely populated areas. In other words, rural development denotes different approaches to interventions by the state in the economies of developing countries, and one that is at once broader and more specific than 'agricultural development'. Broader in the sense that different approaches to the development of the economy as a whole. It would be very clear as it focuses on poverty and inequality (Harris, 2011). Rural Development measurement will focus on items like Income, health, social services, and living condition, respectively. This is shown in Table 3.5 below

Table 3.6
Rural Development

S/NO	Items	Source
1	Electricity has improved my income as a result of petty trade on snacks, provisions, soft drinks (mineral, cold water)	Rashid, 2015
2	News from radio and television provide good information relevant for conducting business	
3	The use of electricity has allowed me to keep my business open for longer hours	
4	The cost of electricity is quite reasonable for my business	
5	With electricity, our living condition has improved	
6	Our household is happy with the lighting system that we have in our home	
7	Electricity has minimized our visits to the urban clinics as basic services are provided in the rural areas	
8	With the use of a fan, sickness like malaria have been reduced drastically in my family	
9	Poor electricity service has affected our business	
10	With electrical light, the children can study at night	

- 11 I feel safe from reptiles in my house at night
- 12 Electricity makes it easy to have information
- 13 Watching TV provides my household with great entertainment and pleasure

Source: (Rashid, 2015)

3.6.6 Political Will

Table 3.6
Political Will

S/N	Items	Source
1	The government set agenda for community development	(Betancourt & Sanguinety, 2008; Post, Raile, & Raile, 2010)
2	Activities of political leaders are transparent (Known to the citizens)	
3	Our community was promised to be connected to electricity during campaign.	
4	Our community was connected to electricity after the election	Universiti Utara Malaysia
5	Our political representatives help us to solve our community problems (e.g., electricity).	
6	Political office holders fulfil their budgetary commitment	
7	Political office holders are major actors in solving electricity problems (Instrumental)	
8	We are satisfied with the electricity obligation of our political representatives	
9	Our political representatives have an influential personalities to solve our electricity problems	
10	Our political representatives consider the provision of electricity as an obligation	
11	Our political representatives are very competent (capability)	
12	Electricity is not imposed on us (It is our felt needs)	
13	There is awareness of electricity activities through meetings (Accountability)	
14	Political representatives occasionally visit us to find out our electricity problems (Relational)	

Source: (Betancourt & Sanguinety, 2008; Post et al., 2010)

Political Will in this study refers to the commitment, promises, obligations, and ability of political office holders representing your constituency in the government to strengthen their set objectives and implement them accordingly. The following questions in Table 3.6 below will help the researcher to know how political will strengthen the power supply in rural communities of Niger.

3.6.7 Good Governance

Table 3.7

Good Governance

S/N	Items	Source
1	There is a clear mission statement and action plan on electricity in Niger State (Electricity for all)	
2	Provision of electricity is a political priority in Niger State (Felt need of the electorate)	
3	Government accepts electricity needs identified by the rural people	
4	Government does not discriminate against the nomination of participants in electricity matters.	
5	Government implements the view of the rural people on electricity matters	
6	There is policy continuity on electricity affairs in Niger State	
7	Elected politicians account for their achievements on electricity from time to time (Accountability)	
8	Steady electricity was based on government commitment	
9	Policy making on electricity was based on the experience of rural electrification problems	
10	Defaulters of electricity bills are punished accordingly without discrimination	
11	Political representatives are proactive in identifying potential problems that may disrupt electricity in my community	
12	Electricity beneficiaries hold a politician accountable for the failure of electricity	
13	Government exhibited good governance mechanisms in policy implementation	
14	The electricity budget fully implemented	
15	Politicians are held very accountable for the failure of electricity in my community	

Source: (Betancourt & Sanguinety, 2008; Post et al., 2010)

3.6.8 Rural Development

RD in this study aimed at enhancing the socio-economic life of those people living in populated areas in the state. This meant that the RD areas enhanced the country's economies through agricultural development. Broader in the sense that different approaches for economic development would be clearer and focuses on poverty as well as inequality (Harris, 2011), RD measurement will focus on items like Income, health, social services, and living condition, respectively. This is shown in Table 3.5 below

Table 3.6

Rural Development

S/NO	Items	Source
1	Electricity has improved my income as a result of petty trade on snacks, provisions, soft drinks (mineral, cold water)	
2	News from radio and television provide good information relevant to conducting business	
3	The use of electricity has allowed me to keep my business open for longer hours	
4	The cost of electricity is quite reasonable for my business	
5	With electricity, our living condition has improved	
6	Our household is happy with the lighting system that we have in our home	Rashid, 2015
7	Electricity has minimized our visits to the urban clinics as basic services are provided in the rural areas	
8	With the use of a fan, sickness like malaria have been reduced drastically in my family	
9	Poor electricity service has affected our business	
10	With electrical light, the children can study at night	
11	I feel safe from reptiles in my house at night	
12	Electricity make it easy to have information	
13	Watching TV provides my household with great entertainment	

Source: (Rashid, 2015)

3.7 Data Collection

This is a procedure for the collection of data through diverse strategies, such as primary sources to generate information about the study. This study used primary methods to collect data from the study area. Before the collection of data, the researcher will obtain formal approval from the Ministry for Local Government, Community Development and Chieftaincy Affairs, which will serve as written consent to conduct a study in the selected rural areas of the state. The researcher will also design a form seeking Niger the approval of the respondents to voluntarily participate in the conduct of this research. The researcher will self-administer the 444 questionnaires to the electricity consumers in the selected rural areas of Niger. Through the multi-stage Sampling technique, the researcher can track the respondents to their respective communities and allow Completing the questionnaires within two weeks. After ten days, the researcher will remind them through phone or any available medium to communicate with the respondents. Upon completion, the researcher will follow up to retrieve the questionnaires.

For a better understanding of the questionnaire, the researcher will Engage the services of English and Hausa experts to translate it into the Hausa version. Note that an even set of scale without a mid-point (neutral) will bring about response prejudice and make respondents select more positive or negative responses against their desire (Hartley, 2014). The researcher shall self-administer the questionnaires.

For qualitative data collection, an in-depth face-to-face interview will be conducted through a prepared interview guide. An example of questions in the qualitative method can refer to Appendix C. Questions in the qualitative data collection based on the quantitative result that show extreme or outlier cases, significant predictors, significant results relating variables, insignificant results, as well as demographics. The guide shall be drafted to ease the researcher's effort to ask all related questions on the performance of EI in the rural areas of Niger State. Explicitly, the interview shall be strictly conducted with the top hierarchy technocrats (Commissioners, Permanent Secretaries, and Directors) in the Ministry of Works and Infrastructure as well as the officials of areas office of Abuja Electricity Distribution Company (AEDC) in Minna Niger. In addition to the above instruments, the study adapts system theory to guide the researcher in explaining the relationship between the independent variable, the intervening, moderating, and dependent variables respectively.

3.8 Data Analysis

This is the research analysis process using statistical tools to establish the relationship between two or more variables, the independent, moderation, mediation, or dependent variables. Smart Partial Least Square (PLS) was adopted for quantitative data analysis in this study. Also, preliminary analyses was carried out to test-run frequency, the normality test, multi-collinearity, and outlier among others in Statistically in Social Sciences (SPSS) for each variable in the study to determine the ordinarieness of the data.

The study also uses NVivo software for qualitative analysis. NVivo was preferred over other software because it permits the use of huge quantity data and also allow graphic Coding in text Editing and contextual remarks. Hence, it is moderately simple to use. NVivo eases the importation of documents directly from a word Processing file and also endure the Coding strips to be noticeable on the documents to enable the researcher to know the informants at a glance (Bazeley & Jackson, 2013; Hilal & Alabri, 2013). Descriptive statistics shall be applied to recognise the respondents' profile (RiNigerle et al., 2012, Akbulut & Cardak, 2012; Bazeley et al., 2013, Sekaran & Bougie, 2014).

3.8.1 Criterion and Rationales for Using SPSS and Partial Least Square Software

SPSS statistical packages are relevant in this study after a thorough comparison based on the defined criteria. Given the fact that its developers add new features and capabilities in each subsequent version, statistical packages have wizards explaining how to work with the software product, and also, its instruction file can be downloaded. In these help wizards and documents, attention is paid to the algorithms for entering data from other packages in different formats.

The main argument for adopting PLS is based for analysis is based on its robustness on the latent variables (RiNigerle, Sarstedt, & Straub, 2012). Formative items can only be computed by PLS not by using the the common structural equation method (Ferry, Fouad, & Smith, 2000). Basically, this study adopts PLS as it tolerates simultaneous analysis of hypothesized relationships amongst the variables. It also offers better prediction ability which suits the key objectives of this study; that is, PLS will allow

the researcher to predict the effect of the power supply on the rural development in of the State (Alpert, Kamins, Sakano, Onzo & Graham, 2001; Ringer et al., 2012). PLS-SEM becomes a good substitute for CB-SEM when predictive accuracy is dominant, and generally. Thus, the data collected from the state rural areas is not considered to be normal (Hanger et., al 2010).

3.9 Pilot Study

A pilot study denotes a tentative experiment of the data to test the efficacy of the questionnaires before Going to the field. This stage helped to forecast the authenticity and validity of the data. Piloting is important and necessary because it serves as guidance and enables the researcher to correct the short coming before the full analysis (Catassi et al., 2013; Su, Gargeya, & Choi, 2012). As a result, the pilot study was examined through the Cronbach alpha method to measure the reliability of the instruments as suggested by the previous studies. Furthermore, 100 copies of questionnaires were distributed to various experts as pilot data after the instrument had been validated by experts academically and through practitioners in the field of electricity business in Nigeria. Out of these, 85 questionnaires were duly completed and received from target respondents. Thus, the data collected were keyed into SPSS for the reliability test. The result of the Cronbach alpha revealed that all variable results were above 0.70, as suggested by Nunnally (1978) and Hair et al. (2014). This indicates that all instruments used were suitable and appropriate to measure the selected variables of the study, as highlighted in Table 3.8 below:

Table 3.8

Pilot Test

Constructs	Items	Cronbach Alpha
Electricity Transition	12	0.821
Electricity Generation	11	0.778
Electricity Distribution	10	0.726
Political Will	14	0.745
Good Governance	15	0.794
Rural Development	13	0.855

Source: Researcher

3.9.1 Content Validity

Content validity is the extent to which an instrument explains the Meaning rooted in particular concepts (Babbie, 2015). Also, content validity is all with a group of professionals to seek their opinions on the study's items, wordings and phrases (Mohamad, Daud, & Yahya, 2014; Sekaran & Bougie, 2014). Based on the above draft, copies of the instruments shall be presented to experts (face validity) within and outside the University Utara Malaysia, College of Law and Government International School (COLGIS), and academic contemporaries for their input. Among them are Prof. Azahar Harun and Dr. Sabarani Gazali of the School of Government UUM, Dr. Abdullah Nasir of the department of Business administration Ahmadu Bello University Zaria, Nigeria and Abubakar Idris of department of public administration, Ibrahim Badamasi Babangida University, Lapai, Niger State, Nigeria.

Validity assesses the capacity to measure matter meant for measurement. Thus, constructive validity centres on determining the level regarding the outcomes which has been attained through measurement in line with the theories upon which the test is

primarily designed (Sekaran & Bougie, 2010). Specifically, construct validity has to do with answering questions: Have the adapted instrument measured what is supposed to be measured as theorized? This study has made the measurement scales into what we call the convergent validity as well, as discriminant validity test in determining the validity of that constructs (Ringle et al., 2012, Sekaran & Bougie, 2013).

3.9.2 Reliability Test

The term "reliability" refers to evaluating a construct's degree of stability across many measures (Hair et al., 2014). The term "reliability analysis" refers to the process of Determining the degree to which measurements are free of random error and produce consistent findings. The instrument's dependability implies that the measurements will produce similar findings when utilized frequently. Reliability is primarily concerned with the consistency of measures that allow for error estimates. Cronbach's alpha was utilized to determine the data's trustworthiness. To determine our instrument's internal consistency, we used Cronbach's alpha test through what is known as reliability commands for Statistical Package for Social Science (SPSS). Also, Nunnally's (1978) recommendation, a Cronbach's Alpha coefficient of 0.7 to be used as a yardstick in this study Cronbach's Alpha coefficient. as indicated above, all the variables are above 0.7, Showing the reliability of the selected instruments.

3.9.3 Assessment and Management of Outliers

According to Hair et al., (2006), outlier is an observation with unique features different from other observations. Zikmund (1997), on the other hand, views outliers as a value that lies outside the normal range of the data, and its presence can distort the estimate

and statistical significance (p-value), biasness, and faulty result (Robin, 2000). After Detecting outliers, they were treated Using Mahala Nobis Distance, an efficient and effective technique of Identifying outliers through the settings of some determined point that will assist in Defining whether a certain point could be classified as an outlier or not. Mahala Nobis Distance is the space or distance between a specific case and the point created by means of all the variables in the analysis of the Remaining cases (Zikmund, 1997).

From the result of the Mahala Nobis Distance analysis conducted in this study, four questionnaires were detected as outliers (above the threshold of Mahalanobis) and were removed. Hence 395 questionnaires were usable for further analysis.

2.10 Theoretical Framework and Research Model

This study investigates the relationship between key variables such as Electricity Infrastructure (EI), Rural Development, Political Will, and Good Governance and their influence on Rural Development. EI is an independent variable that represents the input in line with the principle of system theory. On the other hand, RD is a dependent variable representing the anticipated outcome of the infrastructure, which could strengthen or weakened by political will as a moderating variable. Inconsistencies of previous research (Rural Electrification Authority, 2015; Onochie, 2015; Emodu & Yusuf, 2015) on this subject matter of electricity infrastructure (EI) and rural development (RD) led to the introduction of the moderating variable (Baron & Kenny, 1986), pointed out that political will as a moderator may increase the Strength of the

relationship, decrease the Strength of the relationship or change the direction of the relationship. By implication, a moderator may heighten the vitality of the relationship or cause to diminish the effects between the independent and dependent variables. In line with the philosophy of system theory, political will in this study represent the interaction process between the citizen (rural people) and the stakeholders representing the government. Similarly, Shehu (2020) opened that mismanagement and corruption is another major challenge in sub-Saharan Africa and Nigeria in particular, where governmental corruption is a norm, politics will need to be strengthened by Good Governance and that lead to its introduction.

This study adapts system theory in examining the impacts of electricity infrastructural development in the State's rural areas. A system contains three fundamental elements. This includes objects i.e the parts, elements, or variables within the system. Therefore, a system is a set of things that stimulate or influence one another within an environment to achieve a particular result. The systems collaborative or interactive model of an organizational analysis illustrates stages of input, through processing, and output, which express the concept of openness/closeness. The theory emphasizes the network of relations that sustains the general view of an organization rather than its parts. On the other hand, the open system receives information, which it uses to interrelate with its environment (Bryant, 2011; Joseph, 2013). Openness raises the chances to endure, prosper and accomplish determined goals. The theoretical assumption of system theory in this context is that RD depends on the established institutional mechanisms of EI and political will, as illustrated in the model below.

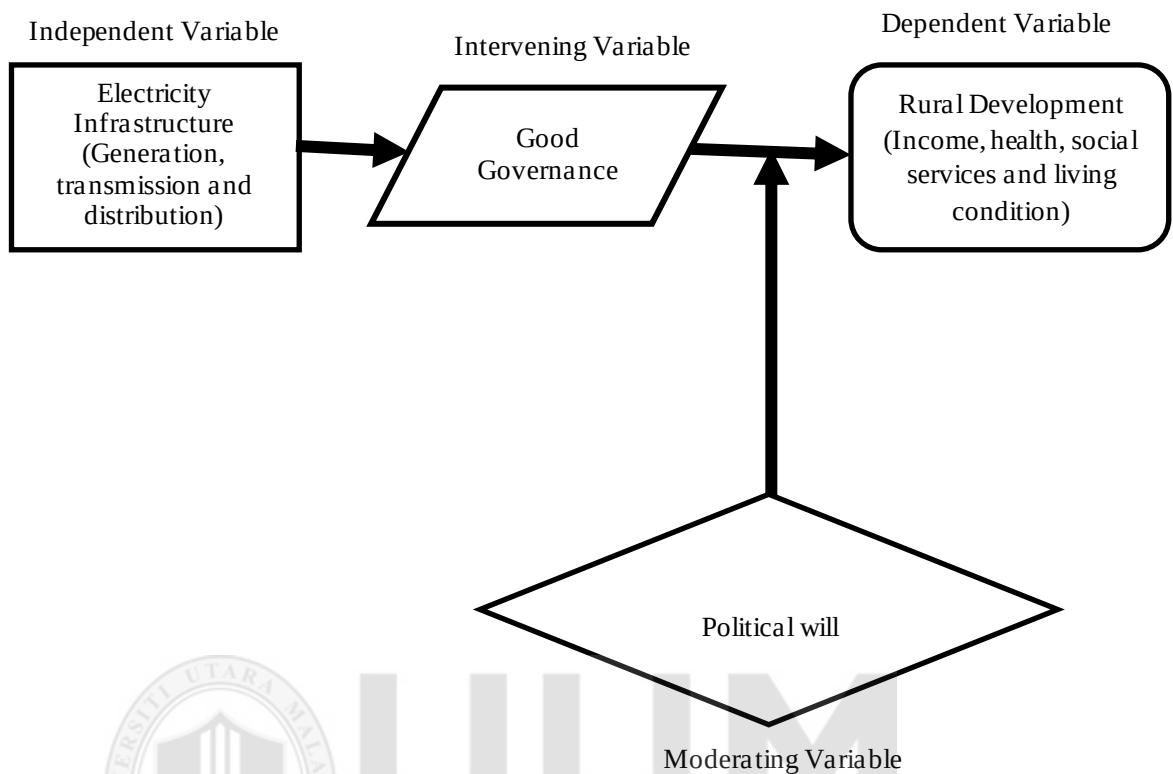


Figure 3.2
Research Model
Source: Researcher

Note: IV box is the independent variable which represents input in the form of demands from the public, MV entails moderating variable representing the deliberation arena called the black box where demands are tabled before the government representatives, MIDV is the mediating variable, and DV refers to the dependent variable which represents the output of the study. This could be in the form of approval or disapproval.

3.11 Conceptual Framework

This study utilizes system theory and the pragmatism (triangulation) to accomplish its objective. The theory becomes a roadmap that investigates the relationship between the independent variable (power supply representing input or demand from the citizens) and the dependent variable. In other words, the input could also be seen as an object or those things available in the environment. At the same time, political will represents the process or moderator, and Political will is the element that assists the citizen to sufficiently enjoy electricity services. On the other hand, the dependent variable (RD) is the outcome of the EI. The outcome could be favourable or unfavourable depending on the political determination of the government in power, and to this end, good governance is introduced to mediate the relationship between political will and rural development in the study. Through the quantitative method, data on the interaction (process) between EI and RD will be gathered Using a questionnaire, while the qualitative method will use interview techniques to explore relevant information from the electricity beneficiaries from the State rural areas.

According to Baron and Kenny (1986), the introduction of moderating variables is necessitated by the contradictory or weak results from previous studies. This condition is apparent in the present study because the (Rural Electrification Authority, 2015) report shows that electricity has improved significantly and impacted the lives of rural dwellers meaningfully. On the contrary (Onochie, 2015; Emodu & Yusuf, 2015) argue that the government has failed to provide sufficient power to its citizenry due to poor political determination and corruption. This disagreement prompted the introduction

of political will as a moderator to assess how it will strengthen the relationship between EI (independent variable) and RDs (dependent variable) in Niger State rural areas. In addition, the objectives will focus on an interview to explore the perceptions of the electricity beneficiaries on the subject matter and identify the challenges and possible strategies to improve electricity services in the state's rural areas.

In line with the principle of the theory, the environment plays a substantial role in the identification of a phenomenon. A good system seeks to strike a balance between the input, process, output, and sending feedback to the environment. By implication, the philosophy of systems theory is to ensure a balance that must be upheld in a system to attain homeostasis or a high propensity to reasonable stability among the interdependent units in an organization. In order to evaluate the performance of government policy and programs, all the units of an organization must be interrelated and work jointly to accomplish the desired objectives. The system theory allows a better understanding of food chains, life cycles, and the environment and therefore facilitates a better understanding of the world around us and explores complications, challenges, and their causes (Heil, 2011).

This study recognized a systematic framework that illustrates linkages between EI and RD as the anticipated result of the study. The two variables have been moderated and mediated by political will and good governance, respectively. The diagram above demonstrates that RD is contingent on EI and genuine political will (Abdullahi, 2014; Little, 2010). This presumes that the RD of any country is a function of a stable and

sufficient power supply to the citizens and foreign investors (Ekeh, 2015; Volk, 2013). According to Ekeh (2015) reveals that paucity and unreliable electricity is a threat to the social and economic life of Nigerian citizens as it has dissuaded investors, entrepreneurs, and managers in their respective transactions, contrary in western countries like the United States of America, United Kingdom, Germany, Canada, Japan, even in Asian countries like Malaysia electricity is no longer an issue. The main consideration and challenge for future energy systems in Europe and America vis-à-vis Asian nations is the electricity generation, transmission and distribution sustainability.

In a similar study, the causes of unemployment in Nigeria were traced to an insufficient and unstable power supply to the industrial sector. The study recommends to the government and the policymakers to devote more attention to electric power generation and ensures that the industries are accorded a higher priority in the supply of electricity (George, 2012). In addition to raw materials shortages, smuggling, the rising cost of Automotive Gas Oil, and corruption challenges, the key problems to the collapse of the Arewa textile industries are infrastructural shortfall and poor electricity supply. With the difficult supply of electricity, manufacturers are compelled to run generating plants, leading to the upward review of the price of textile products and low patronage of the common citizens, especially those in rural areas (Olakitan, 2015).

3.12 Statement of Hypotheses

A hypothesis is a supposition and tentative statement that offer a direction for the research work (Bougie, 2014; Sekaran & Bougie, 2014). Testing these statements is a

prelude to any significant findings; therefore, recommendations that will be made at the end of the study will be based on the statements of the hypothesis. In connection with the objectives of this study, existing literature like Abdullahi, 2014; Kroes, 2011; Bhattacharyya, 2016; Ewugi et al., 2016; Obidike, 2013; Edomah et al., 2016. Null hypotheses are as follows:

Table 3.4
Null Hypotheses

Serial Number	Hypothesis
Direct	
H1	There is a positive relationship between electricity generation and rural development in Niger state
H2	There is a positive relationship between electricity transmission and rural development in Niger state
H3	There is a positive relationship between electricity distribution and rural development in Niger state
H4	There is a positive relationship between electricity generation and good governance in Niger state
H5	There is a positive relationship between electricity transmission and good governance in Niger state
H6	There is a positive relationship between n electricity distribution and good governance in Niger state
H7	There is a positive relationship between good governance and rural development in Niger state
H8	There is a positive relationship between political will and rural development in Niger state
Moderation	
H9	Political will moderates the relationship between electricity distribution and rural development
H10	Political will moderates the relationship between electricity generation and rural development
H11	Political will moderates the relationship between electricity transmission and rural development
Mediation	
H12	The relationship between Electricity Distribution and Rural Development is mediated by Good governance
H13	The relationship between Electricity Generation and Rural Development is mediated by Good governance
H14	The relationship between Electricity Transmission and Rural Development is mediated by Good governance

Source: Researcher

3.13 Chapter Summary

This chapter discusses several methods proposed for this study and justifies the bases for the adoption of this study. The study also clarifies the mixed research methods Linking quantitative and qualitative methods to Triangulate the two sets of data and to come out with a clear picture of the entire study. The chapter further explained the theoretical and conceptual frameworks relating them to the research model.



CHAPTER FOUR

ANALYSIS RESULTS

4.1 Introduction

The previous chapter explained the approach and procedures employed in Conducting this study. This chapter entails the presentation of the statistical results of the data analysis conducted Using (PLS-SEM) Smart PLS software version 3.2.7. The rate of response to the administered questionnaire, such as returned and used questionnaires,, was first discussed and presented, beginning with the first part, which is the Screening of data, assessment of outliers missing value, the accuracy of data input as well as normality test, common method bias, and non-response bias. In furtherance with other analyses discussed, have included factor analysis of the variables, which involves EG, transmission, and distribution. While respondents' profiles such as RD, political will, and good governance. Conclusively, the assessment of the measurement model to determine items and structural models for path coefficient and its t -value. So, all results from hypothesis Testing were also conducted and presented.

4.2 Response Rate

With the excellent cooperation of the researcher and research assistants, 399 questionnaires were returned, representing a 90% response rate. In further analysis of the returned questionnaire, 4 responses were considered unusable for final analysis because they were discovered to be filled unscrupulously. Hence, a total of 395 responses was finally used for the analysis of this study, representing 89% response rate. Achieving this high level of respondent rate necessitates constant check-ups via calls to the respondents to remind and persuade them of how important of their response required to facilitate the success of this research. In line with the view of Creswell (2012), the questionnaire return rate is considered reasonable and adequate if it exceeds 50 per cent of the overall instrument dispatched to the field. The responses were high due to regular reminder and follow-up (Skaran & Bougie, 2014).

Table 4.1
Response Rate of the Questionnaires

Response	Rate
Questionnaires distributed	444
Questionnaires Returned	399
Questionnaires not returned	045
Invalid questionnaires	004
Usable questionnaires	395
Response rate	90%
Valid response rate	89%

Source: Researcher

4.3 Data Screening and Preliminary Analysis

Analysis of any study call for preliminary Screening to recognize any possible infringement of the major assumptions Regarding the use of the multivariate method of data analysis (Joseph, 2007). Data screening is necessary to identify Missing data, outliers, non-normal distributions, and other irregularities in the data distribution (Odom & Henson, 2002).

Sequel to the above, the following preliminary data Screening was carried out by the researcher Using IBM SPSS version 22.0. This includes Missing value analysis, evaluation and management of outliers, normality test, and multi-collinearity test, respectively (Joseph, 2007; Tabachnick & Fidell, 2013).

4.3.1 Missing Value Analysis

According to Alreck and Settle (1995), clean data determines the reliable outcome of any research or study. A preliminary analysis on missing data was carried out to accomplish a reliable result. This is necessary to eliminate any remote responses that may raise invalid outcomes in the study. Using the original SPSS dataset, out of 29,957 data points, 63 were randomly Missing, which accounted for 0.21 percent. Therefore, this study used the median of the nearby point approach to replace the Missing values (Tabachnick & Fidell, 2013). Scholars have been silenced on a tolerable threshold for Missing values upon which a valid statistical inference would be made. However, researchers have established that a messenger rate of five percent or less is non-

significant (Tabachnick & Fidell, 2013). Table 4.2 shows the total and percentage of randomly Missing values in this study.

Table 4.2
Total and Percentage of Missing Values

Latent Variables	Number of Missing Values
Generation	10
Transmission	13
Distribution	13
Good Governance	6
Political will	3
Rural Development	18
Total	63 out of 29,957 data points
Percentage	.21%.

4.3.2 Normality Test

Preceding studies contend that PLS-SEM offers accurate and ideal estimations of extremely abnormal data (Cassel, Hackl & Westland, 1999). Contrarily, in current studies, Hair, Sarstedt, Ringle, and Mena (2012) suggested that researchers should conduct a normality test on the data to determine the skewness and kurtosis of the data because highly skewed or kurtotic data has the possibility to shoot up the bootstrapped standard error estimates (Abdi, Dunlop & Williams, 2009) and consequently bring down the statistical impact of the path coefficients.

At this juncture, the normality tests are complementary to the graphical measurement and a requirement to determine if the data set is well modeled by a normal distribution of the data. Normality could be graphically or numerically represented. Therefore, this study uses a graph to establish the normality of the data collected from the field

(Tabachnick & Fidell, 2013). Accordingly, a large sample size of 200 and above has the influence to decrease the likelihood of standard errors. Also, easy to comprehend the normalcy of data Using a graph of the distribution than computed values. By implication, the skewness and kurtosis can be easily seen at a glance than the use of figures (Field 2009). These reasons justified the adoption of a graphical method of the normality test rather than the statistical methods. Figure 4.1 illustrates that the data collected for this study agreed with the established standard since all the bars on the histogram were captured in the curve.

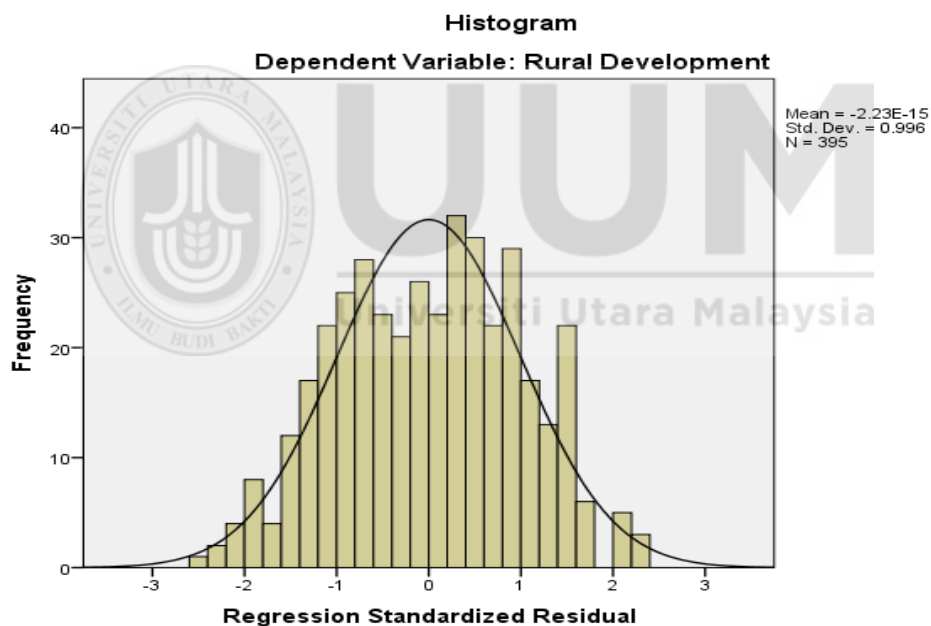


Figure 4.1
Histogram and Normal Probability Plots

4.3.3 Linearity

Linearity assumes a straight-line connection between two variables where one or both variables can be a fusion of several variables. Pallant (2007) emphasized that it is

essential to examine normal curves, and scatter plots to determine the linear (lined) relationship Among the independent and dependent variables. In line with the assumption, a P-P plot and scatter plot were used to verify whether the normality assumption was violated or not. The result of the P-P plot shows that residuals are a reasonably straight diagonal line from the bottommost left to top right, and trail or trace the 45-degree line, and indicating that the normality assumption is attained. The normal plot scatters standardized plot residual for the dependent variable is a normal distribution with most of the scores concentrated in the center. Figure 4.2 and 4.3 illustrates that the normality assumption is achieved, as a result shows no divergence of the normality.

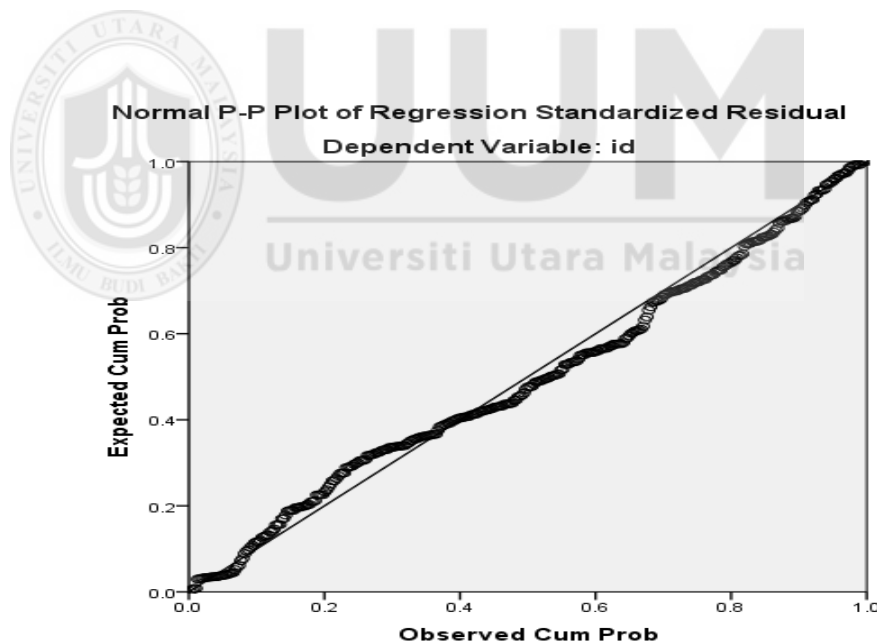


Figure4.2
Normal P-p Plot of Regression Standardized Residual

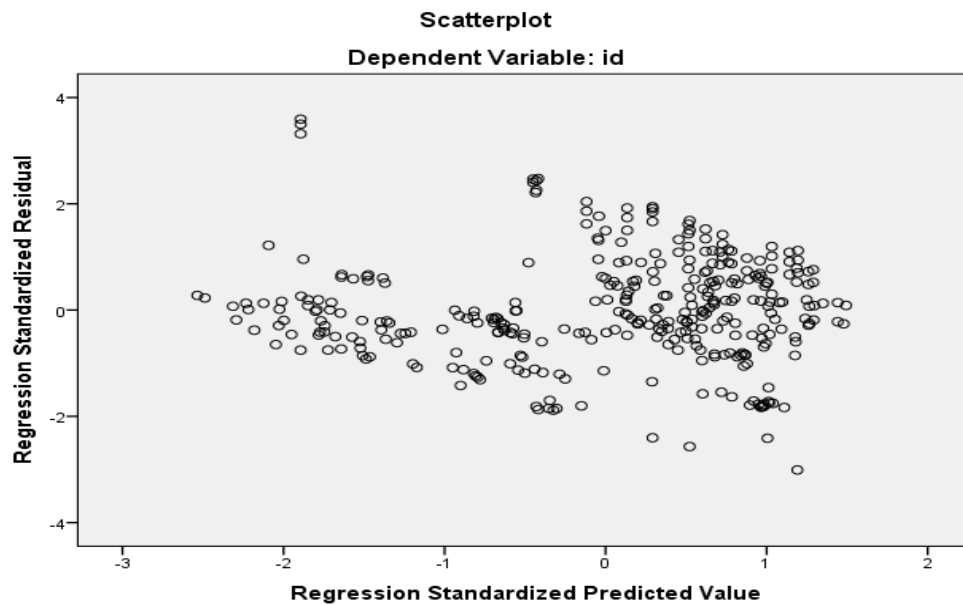


Figure 4.3
Scatter Plot Diagram

4.3.4 Multicollinearity Test

Multi-collinearity is a statistical phenomenon where two or more independent variables in a multiple regression model are highly correlated. Bougie (2014) in a study claimed that multi-collinearity is not a serious problem if the purpose of the study is to predict a relationship between two variables (like the current study) or predict the values of the dependent variable. The author argues that in this situation, multicollinearity does not influence the reliability of the prediction. However, this study considers it appropriate to find out the existence or otherwise of the phenomenon Using tolerance value and Variance Inflation Factor (VIF). The decision to test multicollinearity is based on the excessiveness of this statistical phenomenon Among the exogenous latent constructs suggests an unstable model and the tendency to

considerably misrepresent the analysis and its statistical significance (Hair, Black & Babin, 2010).

The dimension of multicollinearity highlights the extent to which one independent variable is clarified by other variables. Consequently, the threshold value for tolerance value is 0.10, which corresponds to a Variance Inflation Factor (VIF) of 10 (Bougie, 2014). Multi-collinearity becomes an issue of concern if the VIF value exceeds 5, the tolerance value is below 0.20, and the condition index is above 30 (Hair et al., 2012). Based on the above formula, the results in Table 4.3 reveal that VIF is below 5 and the tolerance value exceeds 0.20, implying no evidence of multicollinearity, therefore supporting the measures' reliability.

In line with the threshold, Table 4.3 reveals non-multicollinearity Among the exogenous variables as all VIF values were less than 5, while tolerance values are over .20. Thus, multicollinearity is not a setback in this study.

Table 4.3
Tolerance and VIF Values of the latent constructs

Variable	Collinearity Statistics	
	Tolerance	VIF
Electricity Infrastructure	.424	2.357
Good Governance	.500	2.001
Political will	.448	2.232

Dependent Variable: Rural Development

4.4 Descriptive Analysis of the Latent Variables

Descriptive statistics defines the fundamental characteristics of the data. Descriptive statistics was calculated Using SPSS to find out the mean, median, mode, and standard deviation value for each construct or variable in this study. Furthermore, the latent variables scores were calculated using a five-point Likert scale with 1 = strongly disagree to 2 = strongly agree, 3 = Neutral. 4 = Agree, and 5 = strongly agree, respectively.

The above table shows the complete mean for the latent constructs between between 2.73 and 3.36,, where the mean for electricity distribution stood at 2.73, median 2.70, mode 2.10, and standard deviation .786, representing a moderate level from the respondents. Also, the mean for EG is 3.04, median 3.08, mode 3.00, and standard deviation positioned at .665, which suggests an appreciable level of EG from the respondents. More so, the mean for electricity transmission is 2.86, median 2.75, mode 2.50, and standard deviation positioned at .734, which suggests an appreciable level of electricity transmission from the respondents. The table further shows that the mean for good governance is 2.90, median 2.83, and mode 2.80 with a standard deviation of .701, confirming the moderate level of the respondents. With regards to the results on political will as shown in the table, a moderate mark was obtained for mean 2.73, median 2.71, mode 2.64 and standard deviation .675, and RD stood at mean of 3.36, median 3.38, mode 3.85, and standard deviation .860 indicating the highest for all the variable tested.

Table 4.4
Descriptive Statistics

Variable	N	%	Mean	Median	Mode	Std. Deviation
Electricity Distribution	395	61.7	2.73	2.70	2.10	.786
Electricity Generation	395	44.2	3.04	3.08	3.00	.665
Electricity Transmission	395	53.9	2.86	2.75	2.50	.734
Good Governance	394	49.2	2.90	2.83	2.80	.701
Political will	395	45.5	2.73	2.71	2.64	.675
Rural Development	394	73.9	3.36	3.38	3.85	.860

Source: Researcher, 2018

4.5 Respondents' Profile

The features of the respondents that partook in the survey were presented and described in this section. Given that the unit of analysis of this study is the Individual household who are the electricity consumer and habitants of the selected eighteen rural communities in twelve Local Governments across the three senatorial districts of Niger state, their profiles were presented on the basis of Gender, Age, Marital Status, Occupation, Qualifications, Income before and income after as depicted in Table 4.4.

The gender distribution of the respondent shows that males was 287 (72.8%) while the remaining 107 (27.2%) were female. The respondents between the ages of 26 to 35 have the highest participation with 149 (38%) respondents, followed by those between the ages of 15 to 25 years with 138 (35.2%) respondents, the respondents between the ages of 36 to 45 were 72 (18.4%), and 46 to 55 were 30 (7.7%), while the lowest number of respondents that participated in term of age are within 56 and above with 3 (0.8%). In the marital status, Single respondents recorded the highest participation with 193 (49.4%), married with 187 (47.8%), while divorce and widow recorded a figure

of 6 (1.5%) and 5 (1.3%), respectively. In terms of occupation, the majority of the respondents are civil servants with 174 (44.3%), businesspeople followed with 162 (41.2%), while farmers are the lowest with 57 (14.5%). In the qualification category, the majority of the respondents, 158 (40.1%), had a diploma 115 (29.2%) were university/polytechnic graduates, while 90 (22.8%) were secondary school certificate holders, and only 18 (4.6) and 13 (3.3) had primary education and adult /Quranic education respectively.

As can be observed from the table that the respondent's income after electricity installation improved reasonably, with 15 (3.9%) having an income of between 151,000 and above as against 2 (0.5%) in the same Range as income before electricity. More so, where income before electricity is 19 (4.9%), it was 43 (11.3%) for income after electricity in the range of 101,000 to 150,000, while in the 51,000 to 100,000, income before was 50 (13%) and income after 77 (20.2%). For 20,00 to 50,000, income before was 81 (21.1%) and income after 112 (29.4%). Lastly, for the income of 20,000 and below, income before was 232 (60.5%), while income after was 134 (35.2%). The profile of the respondents signifies that EI in the rural areas would improve the rural dwellers' income, which can be observed from Table 4.5 below.

Table 4.5
Summary of Respondents' Profile

Respondent Description	Frequency	Percentage %
Gender		
Male	287	72.8
Female	107	27.2
Age		
15-25 Years	138	35.2
26-35 Years	149	38.0
36-45 years	72	18.4
45-55	30	7.7
56 and Above	3	0.8
Marital Status		
Single	193	49.4
Married	187	47.8
Divorce	6	1.5
Widow	5	1.3
Occupation		
Civil Servant	174	44.3
Farmer	67	14.5
Business	162	41.2
Qualification		
Adult Educ/Qur'an	13	3.3
Primary Certificate	18	4.6
Secondary Certificate	90	22.8
Diploma	158	40.1
BSc/HND	115	29.2
Income Before		
Below-20,000	232	60.5
20,000-50,000	81	21.1
51,000-100,000	50	13
101,000-150,000	19	4.9
151,000 and above	2	0.5
Income After		
Below-20,000	134	35.2
20,000-50,000	112	29.4
51,000-100,000	77	20.2
101,000-150,000	43	11.3
151,000 and above	15	3.9

4.6 Evaluation of the PLS-SEM Results

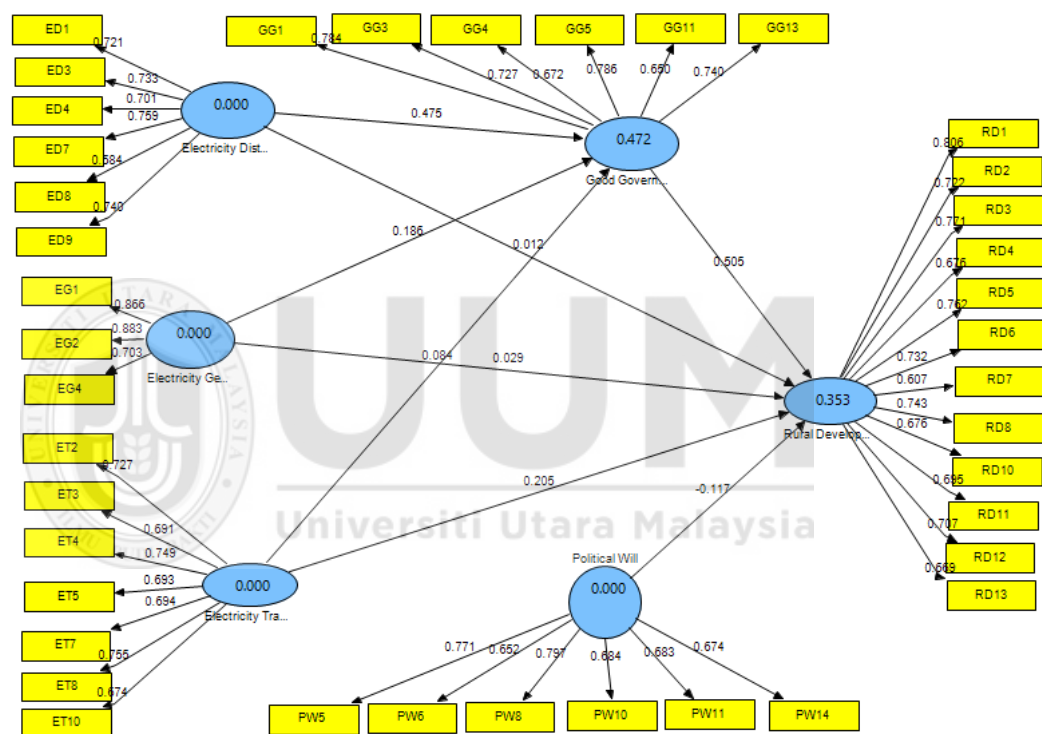
Partial Least Square, Structural Equation Modeling results of this study, as presented in this section have been recommended in two phases in the previous study (Ringle *et al.*, 2015; Hair *et al.*, 2014; Tabachnick & Fidell, 2013; Hair *et al.*, 2011). “The phases are measurement models and structural model assessments (Hair, Black & Babin, 2010; Hair *et al.*, 2011). The measurement model’s evaluation gives outcomes of reliability of items individually, constructing both internal consistency reliability and validity (convergent and discriminant). As well the structure’s model assessments give the outcomes of collinearity, also, path coefficients. Variance explained (R^2), effect size (f^2), and predictive validity (Q^2). Furthermore, this part assesses the collaboration effect of both the Moderating and Mediating variables on the relationship between independent and dependent variables, the moderating and the mediating variables”.

4.6.1 The Assessment of Measurement Model

As mentioned, this research applied the PLS-SEM to assess the model with the Smart PLS software version 3.2.7 (Tabachnick & Fidell, 2013; Ringle *et al.*, 2015). PLS-SEM entails two major multivariate techniques: factor and multiple regression analysis (Hair *et al.* 2010). Phase one of the analysis conducted with PLS-SEM was the evaluation of the measurements model, refers as an outer model. “This phase entails validity or authenticity and reliability, which are the key standards that had been utilized in PLS analysis concerning the evaluation of this measurement model (Ringle *et al.*, 2015; Tabachnick & Fidell, 2013). Based on the standards of measurement assessment model, this study revealed that the reliability of items, as well as construct

internal consistency reliability and convergent validity by applying outer Loading and average variance explained (AVE)” and composite reliability.

Hence, two criteria of cross Loading and Fornell-Lacker were used to determine the discriminant validity of the constructs. Figure 4.4 shows the PLS measurement model.



Note: RD (RD) = dependent variable; EG (EG), Electricity transmission (ET), Electricity distribution (ED) = independent variables; Good governance (GG) = Mediating variable; Political will (PW) = Moderating variable

Figure 4.4
PLS Measurement Model

Figure 4.1 indicates(3) three main types of values. These values as pointed by the longest arrow in the lines shows the path coefficients. Also, the values been directed

box with yellow colour indicated the item's loadings', and the values in the other two blue spheres present the coefficient of determination (R^2). Thus, the result of the coefficient of determination in this study indicated the total contribution between independent constructs and dependent constructs (35.3%). Likewise, the relationship between independent variables and mediating variable (Good governance) indicates ($R^2 = 47.2\%$). This shows the medium contribution as suggested by Chin et al. (1998). The measurement model comprises internal consistency reliability, indicator reliability, convergent validity as well as discriminant validity, as explained in the subsection below:

4.6.1.1 Construct Reliability and Validity

Hair *et al.* (2014) defined reliability as the estimation of the degree of stability amongst various measurements of a construct. Reliability also assesses the level at which random error has been freed and yield consistent results. Thus, reliability Regarding the instrument will indicate the measures that generate similar results if applied continuously. Also, the validity assists in assessing the capacity of what would be measured. Therefore, the main aim of the validity construct was to determine the levels at which the outcomes attained from the usage of a measure in line with the theories that have been designed primarily for the study (Sekaran & Bougie, 2010). Specifically, construct validity has to do with given answers to the question: do the adapted instruments measure what it supposed to measure been theorized? Therefore, to determine the validity of the construct, this study used the convergent and discriminate validity measurement (Sekaran & Bougie, 2013).

4.6.1.2 The Reliability of Individual Measurement Items

The loaded items were employed to control the reliability of an item (Byrne, 2010). This has a correlation and coefficients between distinct indicators as well, as latent construct used for the measurement. Hence, the values of items loaded have been ranged in-between 1 and 0 as argued by Byrne (2010), that no any value has indicated the accepted most acceptable Loading. Nonetheless, Hair *et al.* (2013) and Hair *et al.* (2017) have observed a threshold of 0.70 as generally acceptable for items Loading. It was also indicated that 0.40 are accepted in some cases. However, loading' between 0.4 and 0.7 can be deleted if the removal of such item increases the composite reliability (CR) or average variance extracted (AVE) of the construct it measures more than the recommended value (Byrne, 2010, Hair *et al.*, 2014). In connection with the above thresholds, items loading' with less than 0.4 were discarded also, those with Loading items with less than 0.7 that enhanced the AVE has been retained. The outcomes of those items Loading as indicated in Table 4.9, showed the loaded items are above 0.4, indicating the reliability or authenticity of the items".

4.6.1.3 Internal Consistency Reliability

This signifies the level of connection amongst items that measure a construct with higher correlation representing higher reliability and lower ones meaning lower reliability (Kline, 2015, Fornell & Lacker, 1981). Composite reliability (CR) evaluations were utilized to evaluate internal consistency's reliability in this research. This is preferred because of CR's ability to provide an accurate approximation of the reliability of the variables by reducing the inaccurate assumption regarding the

equality of the items factor loading that may exist in the Cronbach alpha valuations (Hair *et al.*, 2014). Related statistical literature posited CR as the major preferred model for analyzing PLS-SEM (Fornell & Lacker, 1981. Chin, 1998;). Also, Hair *et al.*(2014) proposed that the coefficient of CR must not be less than 0.7. Therefore, as shown in the table below, the values for the coefficients of CR to all the variables in this research are greater than 0.7 as recommended. This depicts that all the constructs possess adequate internal consistency reliability.

4.6.1.4 Convergent Validity

This is a form of variable validity that evaluates the level that accurately measures what is intended to be measured and has a positive correlation with alternative measures that are of the same variables (Hair *et al.*, 2017). Thus convergent validity in a construct happens if the items regarding such constructs are joined or shared with common or great proportions of that variance (Hair *et al.*, 2014). However, this has become a commonly applied technique which many researchers use in determining the convergent validity of average variance extracted (AVE) (Fornell & Larcker (1981, Hair *et al.*, 2017). As opined by Fornell & Larcker (1981), the measurement for convergent validity remains that of average variance explained (AVE). It was theorized that AVE is the complete average of what is known as squared loading of the items given variable. Hence, an AVE of 0.50 value and even above indicates that the construct is having convergent validity (Hair *et al.*, 2011). The main reason for the argument remains that AVE with 0.50 shows that the existing variables expound half of the constructs of its items (Hair *et al.*, 2014).

However, suitable convergent validity needs that the AVE of each dormant variable must not be less than 0.50, as noted by scholar Chin (1998). In line with this recommendation, the entire AVE values in this research are having greater than that of the suggested value of 0.50 in their respective constructs, which shows efficient convergent validity. Table 4.6 indicates the convergent validity of every construct in this research”.

Table 4.6
Summary of Items Loading, Composite Reliability, and Average Variance Extracted (AVE)

Constructs	Item Code	Loadings	AVE	Cronbach's Alpha	Composite Reliability
Electricity Distribution	ED1	0.721	0.502	0.7998	0.857
	ED3	0.733			
	ED4	0.701			
	ED7	0.759			
	ED8	0.584			
	ED9	0.740			
Electricity Generation	EG1	0.866	0.674	0.7552	0.860
	EG2	0.883			
	EG4	0.703			
Electricity Transmission	ET10	0.674	0.508	0.8406	0.878
	ET2	0.727			
	ET3	0.691			
	ET4	0.749			
	ET5	0.693			
	ET7	0.694			
	ET8	0.755			
Good Governance	GG1	0.784	0.531	0.8217	0.871
	GG11	0.650			
	GG13	0.740			
	GG3	0.727			
	GG4	0.672			
	GG5	0.786			

Constructs	Item Code	Loadings	AVE	Cronbach's Alpha	Composite Reliability
Political Will	PW10	0.684	0.507	0.8114	0.860
	PW11	0.683			
	PW14	0.674			
	PW5	0.771			
	PW6	0.652			
	PW8	0.797			
Rural Development	RD1	0.806	0.513	0.9136	0.926
	RD10	0.676			
	RD11	0.695			
	RD12	0.707			
	RD13	0.669			
	RD2	0.722			
	RD3	0.771			
	RD4	0.676			
	RD5	0.762			
	RD6	0.732			
	RD7	0.608			
	RD8	0.743			
	RD4	0.678			
	RD5	0.763			
	RD6	0.732			
	RD7	0.608			
	RD8	0.744			

4.6.1.5 Discriminant Validity

Hair *et al.* (2010) defined discriminant validity as the extent to which a construct is different from other constructs. Discriminant validity similarly affirms that a group of items assesses a variable clearly from another group of items which measures other variables (Chen & Rossi, 1987). Also, this kind of validity proves that every item measuring a specific variable has a relationship to the one being already measured than the way they are with other variables in the study model (Hair *et al.*, 2014)". Hence,

as established by prior researchers, this study assesses the discriminant validity for each construct through cross-loading (Chin, 1998; Fornell & Larcker, 1981).

In line with the above, Cross loading results are the first criterion for measuring the discriminant validity, as indicated in this research. This method of discriminant validity assessment presumes any items that have measured a variable shall be strongly related to the variable that was measured theoretically (Chin, 1998). Therefore, item loading in the variable that has been measured shall be high than the loading in the other variables on the model (Chin, 1998). This means item-level discriminants validity (Henseler *et al.*, 2015). Also, the requirement removes specious relationship between items and variables in the model (Chin, 2010). As it has been indicated in the following Table 4.6, the cross-loading values of every item of the variable affirmed the condition that the discriminant validity was achieved in respect of this study.

Table 4.7
Cross Loading

Code	ED	EG	ET	GG	PW	RD
ED1	0.721	0.573	0.544	0.498	0.431	0.434
ED3	0.733	0.493	0.526	0.485	0.528	0.223
ED4	0.701	0.484	0.458	0.437	0.398	0.310
ED7	0.759	0.511	0.477	0.495	0.481	0.320
ED8	0.584	0.346	0.373	0.433	0.328	0.201
ED9	0.740	0.567	0.5927	0.477	0.583	0.330
EG1	0.6128	0.866	0.6249	0.500	0.483	0.438
EG2	0.644	0.883	0.6665	0.501	0.6054	0.333
EG4	0.472	0.703	0.513	0.437	0.447	0.210
ET10	0.382	0.395	0.674	0.372	0.398	0.268

Code	ED	EG	ET	GG	PW	RD
ET2	0.521	0.5947	0.727	0.410	0.466	0.324
ET3	0.462	0.499	0.691	0.307	0.378	0.239
ET4	0.536	0.563	0.749	0.494	0.457	0.401
ET5	0.442	0.505	0.693	0.326	0.484	0.149
ET7	0.500	0.451	0.694	0.318	0.443	0.267
ET8	0.6149	0.6153	0.755	0.462	0.543	0.431
GG1	0.510	0.476	0.393	0.784	0.472	0.468
GG11	0.436	0.402	0.372	0.650	0.431	0.365
GG13	0.531	0.404	0.440	0.740	0.465	0.463
GG3	0.419	0.389	0.332	0.727	0.429	0.460
GG4	0.463	0.400	0.455	0.672	0.477	0.306
GG5	0.541	0.477	0.439	0.786	0.491	0.412
PW10	0.345	0.317	0.321	0.414	0.684	0.303
PW11	0.408	0.387	0.361	0.355	0.683	0.179
PW14	0.508	0.478	0.537	0.408	0.674	0.188
PW5	0.503	0.524	0.535	0.550	0.771	0.325
PW6	0.504	0.487	0.467	0.433	0.652	0.137
PW8	0.558	0.511	0.535	0.501	0.797	0.292
RD1	0.370	0.377	0.393	0.487	0.253	0.806
RD10	0.191	0.162	0.180	0.291	0.138	0.676
RD11	0.239	0.240	0.236	0.363	0.193	0.695
RD12	0.107	0.111	0.117	0.313	0.163	0.707
RD13	0.188	0.186	0.159	0.296	0.177	0.669
RD2	0.333	0.345	0.319	0.436	0.298	0.722
RD3	0.379	0.337	0.364	0.461	0.289	0.771
RD4	0.352	0.330	0.392	0.336	0.235	0.676
RD5	0.273	0.239	0.314	0.340	0.235	0.762
RD6	0.339	0.325	0.335	0.460	0.372	0.732
RD7	0.440	0.392	0.446	0.512	0.367	0.608
RD8	0.327	0.275	0.306	0.420	0.214	0.743

Furthermore, in Determining this, discriminant validity using the Fornell-Lacker procedures signifies the square root of an average construct extracted (AVE) to be gained, as well, compared with the correlations of the other variables in this research. (Chin 2010; Fornell & Larcker 1981). In the meantime, to have acceptable discriminant validity, the squared root of the AVE shall have exceeded the highest correlation approximates of that variable that was measured (Hair *et al.* 2006). Hence the square root of all AVE and for the entire variables was arranged diagonally, which was against the correlation coefficient of the other variables as indicated in Table 4.8, which has the value in bold texts as well, this shows the evidence of the efficient discriminant validity. The outcomes of the discriminant validity indicated that the entire variables met the Fornell-Lacker standard is displayed in Table 4.8.

Table 4.8
Fornell-Larcker Criterion

	ED	EG	ET	GG	PW	RD	AVE
ED	0.708						0.502
EG	0.707	0.821					0.674
ET	0.704	0.736	0.712				0.508
GG	0.666	0.584	0.555	0.728			0.531
PW	0.650	0.623	0.638	0.632	0.712		0.507
RD	0.437	0.410	0.441	0.570	0.359	0.716	0.513

Note: Rural Development (RD) = dependent variable; Electricity generation (EG), Electricity transmission (ET), and Electricity distribution (ED) = independent variables; Good governance (GG) = mediating variable; Political will (PW) = moderating variable and Average variance extracted (AVE)

4.6.2 Assessment of Structural Model

Another step of “the PLS analysis besides the measurement model was the valuation of the structural model known as the inner model. The structural model measures the correlations concerning dormant variables in this proposed model (Hair *et al.*, 2016). The correlations between the construct in the hypothetical study model specified the

hypotheses were established via the structural model. Moreover, the structural model evaluates the interconnections in-between exogenous constructs, EG, electricity transmission, and electricity distribution, and the endogenous variable, RD, the mediation, and the suggested moderator, good governance. In this research, the structural model assessed the path coefficient significances of that structural model relations, and level of coefficient of determination (R^2), effect sizes (f^2), and predictive relevance, that is (Q^2).

4.6.2.1 Direct Path Coefficients Assessment

according to Chin (1998) and Hair *et al.* (2013), the assessment of both direct and indirect (Mediation and Moderation) paths coefficient requires bootstrapping techniques. As explicated by Henseler *et al.* (2016), bootstrapping “means the process that draws so many re-samples which involves the replacements from the original sample, estimation for the model parameters of every bootstrap re-sample. Consequently, this research utilized bootstrapping in evaluating the significance of these direct and indirect paths (Mediation and Moderation) coefficients (Hayes, 2012). However, to achieve the best and most appropriate statistical significance of the direct path coefficients as specified in the literature (Hayes, 2012, Hair *et al.*, 2013, Hair *et al.*, 2012), therefore, this research made use of the bootstrap sample of about 5000 as it was suggested by the scholar's Hair *et al.* (2017). This bootstrapped model (structural model) regarding the direct relationship was indicated in the following Figure 4.5

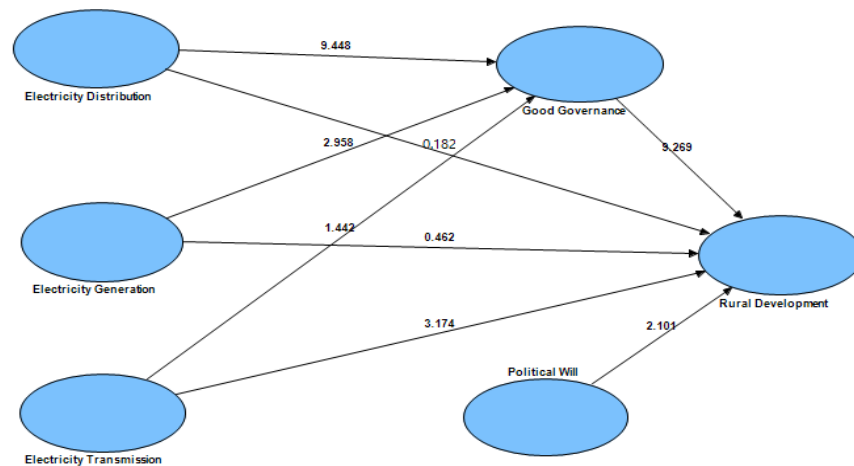


Figure 4.5
The Structural Model of the Direct Path

The outcomes of the structural model of the direct relationships in-between exogenous and endogenous constructs of this research as indicated in Table 4.9.

Table 4.9
Direct Path Coefficients

Paths	Beta (β)	STDEV	T Statistics	P-Values	Remark
EG ->RD	0.029	0.062	0.462	0.644	Rejected
ET -> RD	0.205	0.065	3.174	0.002***	Accepted
ED ->RD	0.012	0.068	0.182	0.856	Rejected
EG ->GG	0.186	0.063	2.958	0.003***	Accepted
ET -> GG	0.084	0.058	1.442	0.150	Rejected
GG -> RD	0.505	0.055	9.269	0.000***	Accepted
PW -> RD	0.117	0.056	2.101	0.036**	Accepted

Note: Rural Development (RD) = dependent variable; Electricity generation (EG), Electricity transmission (ET), and Electricity distribution (ED) = independent variables; Good governance (GG) = mediating variable; Political will (PW) = moderating variable; Beta (β) = coefficient, Standard deviation (STDEV), T statistics, P-Value = statistical significance *** = 1%, ** = 5% and *10%.

Table 4.8 indicates the outcomes regarding the direct hypothesis tested, and the discussions in Table 4.9 are presented as follows:

Hypothesis 1: There is a good or positive relationship in-between EG and RD in State. Through path Linking EG to RD on Table 4.8. The findings from the table revealed the path values for the linkages in-between EG as well, RD with beta ($\beta = 0.029$), t-statistic ($t = 0.462$), and p-value ($p = 0.644$). This means that the relationship in-between EG and RD is not statistically important. thus, Null, the hypothesis H_1 was rejected in line with this outcome”.

Hypothesis 2: “There exists a good or positive relationship in-between electricity transmission as well, RD in Niger State, which has been represented by the path Linking ET to RD as shown in Table 4.8. Also, the path estimations of this relationship show beta ($\beta = 0.205$), t statistics ($t = 3.174$), and p-value ($p = 0.002$). Therefore, the hypothesized relationships in-between ET and RD have been accepted in line with these estimates, which indicates positive as well, significant relationship at a 5% significance level. In line with these outcome, hypothesis H_2 has been accepted.

Hypothesis 3: There exists a good or positive relationship in-between electricity distribution and RD in the State, which is represented by the path Linking ED to RD and with the path values of beta ($\beta = 0.012$), t statistics ($t = 0.182$) and p-value ($p = 0.856$). The outcomes provide as there is a statistically insignificant relationship between the two variables. Therefore, hypothesis H_3 was rejected.

Hypothesis 4: There “exists a good or positive relationship in-between electricity distribution and good governance in Niger State, as represented by path Linking ED to GG with path estimates of beta ($\beta = 0.475$), t statistics ($t = 9.448$) and p-value ($p = 0.000$) as indicated in Table 4.8. This outcome meant a good or positive and significant relationship in-between ED and GG at a 1% significances level. Hence the suggested hypothesis H_4 is equally accepted. This outcome shows that electricity distribution is positively and significantly related to good governance in the State.

Hypothesis 5: There exists an excellent or positive relationship in-between EG and good governance in NIGER, which is represented by the path Linking EG to GG with path values of beta ($\beta = 0.186$), t statistics ($t = 2.958$) and p-value ($p = 0.003$). These outcomes give significant support to the hypothesized relationship in this research specifying that EG has a positive good and significant relationship with good governance at a 1% level of significance”. Therefore, the outcomes justify the acceptance of hypothesis H_5 as specified in the model.

Hypothesis 6: There exists a good or a positive relationship in-between electricity transmission as well good governance in Niger which represents the path Linking ET to GG with path values of beta ($\beta = 0.084$), t statistics ($t = 1.442$) and p-value ($p = 0.150$). Though the results reveal a positive relationship between electricity transmission and good governance, has no statistically significant relationship. Hence, hypothesis H_6 was rejected.

Hypothesis 7: There exists a good or positive relationship in-between good governance and RD in the State represented by the path linking GG to RD with path values of beta ($\beta = 0.505$), t statistics ($t = 9.269$) and p-value ($p = 0.000$). These outcomes give significant support for the hypothesized relationship in this research, been specified that good governance is positively and significantly related to RD at a 1% level of significance. Therefore, the outcomes of the analysis support hypothesis H7 to be accepted.

Hypothesis 8: There exists an excellent or positive relationship in-between political will and RD in NIGER been represented by the path linking PW to RD with path values of beta ($\beta = 0.117$), t statistics ($t = 2.101$) and p-value ($p = 0.036$). These outcomes give significant support to the hypothesized relationship in this research by specifying that political will has been significantly related to RD at a 5% level of significance. Therefore, the outcome made this study accept hypothesis H8 as proposed in the model.

4.6.2.2 Moderating Path Coefficient Assessment

The Interaction term “refers to the concept applied to enable the presence of moderation constructs in a statistical model. Surviving literature suggested that the product indicators, two-stage and orthogonal zing methods as means which enable the interaction (political will) impact in-between independent and moderating constructs can be created in a structural model (Henseler and Chin (2010) Dawson, 2013; Hair *et al.*, 2017; Henseler & Chin, 2010; Henseler & Fassot, 2010; Rigdon *et al.*, 2010). In

determining which of those three methods shall be adopted, Henseler and Chin (2010) conducted a comprehensive simulation study and compared the approaches in line with their statistical power, point valuation accuracy, and projecting accuracy. Scholars like Hair *et al.* (2017) argued for using product indicators and orthogonal zing techniques when both the independent and moderating variables have influential measurements. Hence, anywhere the independent and moderating variables are insightful, and the objective helps determine whether the moderator has exerted a significant effect regarding the relationship between independent and dependent variables, for instance, in line with the present research, the two-stage methods remain the best. Because these methods have yielded a higher statistical power than orthogonalizing as well product indicator techniques, in the meantime, the objective is to reduce the estimation bias and maximize the prediction of the endogenous variable, and the orthogonalizing method shall be used as it is, in terms of point of both estimate and prediction accuracies”.

However, scholars like Hair *et al.* (2017) recommended the use and application of those two-stage methods in modeling the interaction term due to its universal applicability regarding whether the independent and moderating variables (political will) are being measured formatively or been measured reflectively in line with that it exhibits of a higher levels statistical power. Thus, in connection with the above, the two-stage methods had been employed in creating interactions in-between the moderator (PW) as well as those three independents constructs, namely, (ED, EG, and

ET) as revealed in Figure 4.5” that clarified the testing of the hypotheses of this research.

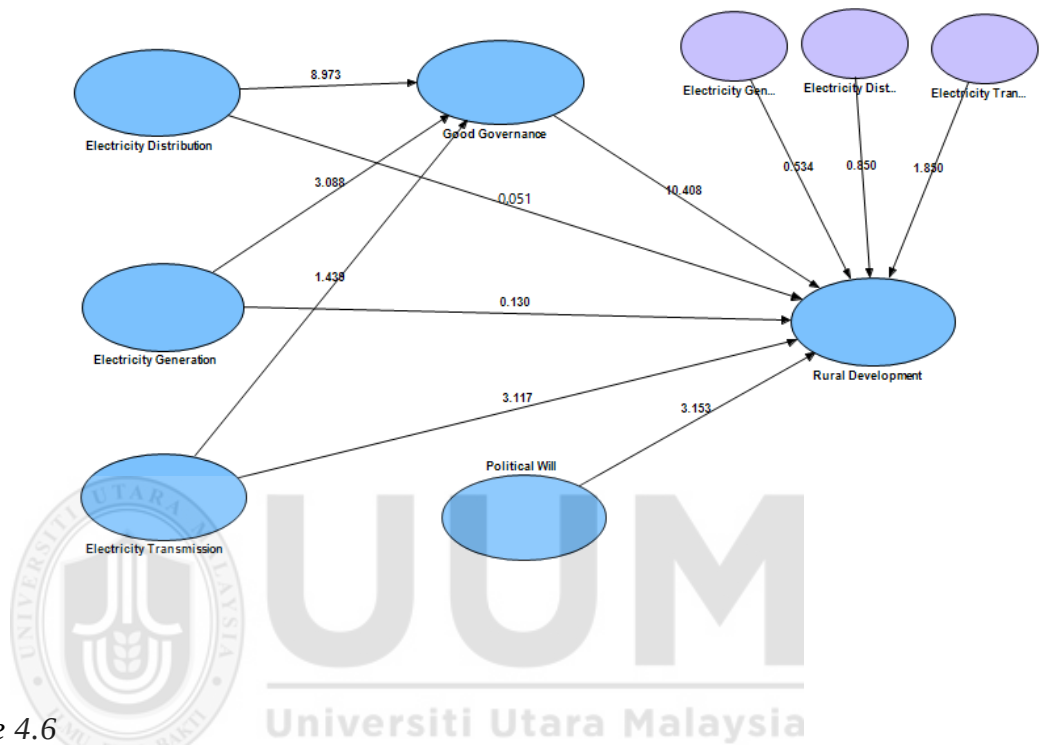


Figure 4.6
The Structural Model of Moderating Path

The finding of the structural model of the moderating effects regarding the relationships in-between independent and dependent variables of this research are shown in Table 4.10

Table 4.10
Moderating Path Coefficient

Paths	Beta	STDEV	T Statistics	P Values
ED*PW ->RD	0.056	0.066	0.850	0.396
EG*PW ->RD	0.038	0.072	0.534	0.594
ET*PW ->RD	0.138	0.074	1.850	0.065

Hypothesis 9: The Political will moderate the relationship in-between electricity distribution and RD. As indicated in figure 4.5 and table 4.9, the moderating effects of political will concerning the relationship between electricity distribution and RD are depicted by ED*PW to RD. The finding shows the corresponding t statistics ($t = 0.850$) and p-value ($p = 0.396$). Hence, it did not support the hypothesized moderating effects specified in the research.

Hypothesis 10: Political will moderate the relationship in-between EG and RD is illustrated by the interaction path EG*PW to RD in table 4.9. Thus, the interaction of Political-will in the relationship in-between EG and RD is very low with t statistics ($t = 0.534$) and not significant with that of a p-value ($p = 0.594$), meaning the finding has not supported Hypothesis 10 as it was proposed in the model.

Hypothesis 11: Political will moderates the relationship between electricity transmission and RD in relations with path ET*PW to RD has been represented in table 4.9, which indicates a statistically significant moderation regarding political will on its relationship between the electricity transmission as well, RD with statistics t ($t = 1.850$) and p-value ($p = 0.065$).

Furtherance to the significant moderation effect of H11 and per Preacher et al. (2007) recommendation, additional analysis was conducted to justify the interaction effect. Hence, a two-way interaction slope was presented with the path coefficient and

interaction effect figures attained from the model. The output is illustrated below in figure 4.6.

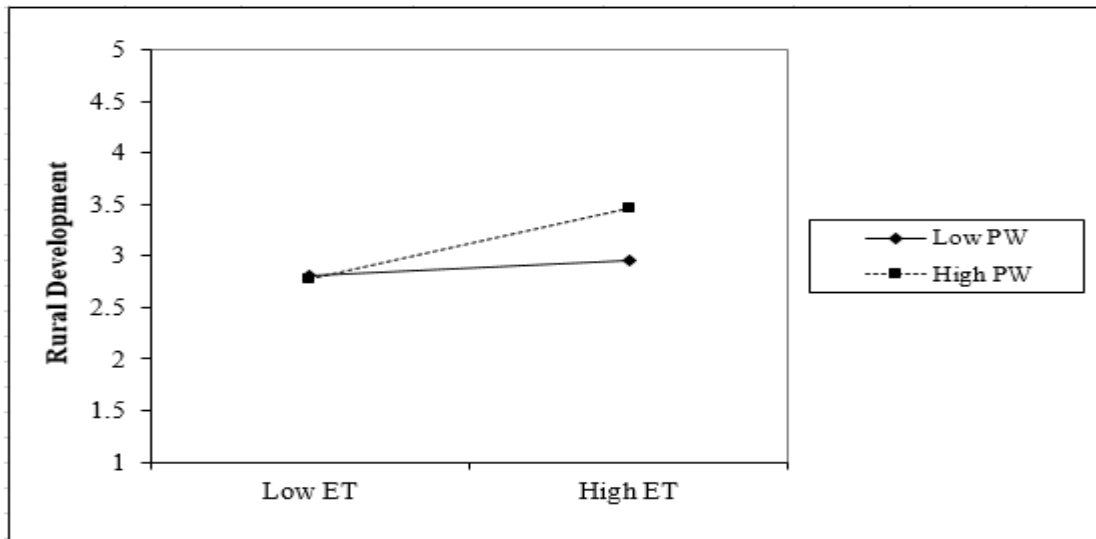


Figure 4.7
The Interaction Effect of PW and ET on RD

Figure 4.6 represents the interaction effects of political will and electricity transmission on RD. As noted in figure 4.6, concerning hypothesis H11 regarding the moderating effect of PW on its relationship between ET and RD. It shows the existing positive relationship between ET as well, and RD is strengthened on the basis of a high level of the presence of PW. Also, with a lower level of PW, the relationship in-between ET and RD has been weakened. Meaning that the higher the exhibition of PW by the political leaders and administrators in the Niger State of Nigeria, the more to the stronger or better good or positive relationship between ET and RD and vice versa.

4.6.2.3 Mediation Effects

Preacher and Hayes's (2013) approach to mediation was the basis upon which the mediating hypothesis was analyzed for this study. According to them, the mediation did not necessarily have to follow Baron and Kenny's (1986) approach, which specified that the direct effect must hold. They argued that mediation could be established even if the direct effect does not hold, thus explaining that the presence of mediating ought to overturn the relationship between independent and dependent variables and that the significant direct relationship is not compulsory. According to the rule, mediation is observed if the t-value is ≥ 1.96 at the significance level of 0.05 using a two-tail or 1.64 at the significance level of 0.05 if it is a one-tail test (Hair et al., 2010). As depicted in Table 4.11 below, out of the three mediating hypotheses, one was supported, while the other two did not support the mediating effect.

Table 4.11:
Mediating Hypothesis

Constructs	Indirect Effect	SE	t-value	95% LL	95% UL
ED -> GG -> RD	0.240	0.050	4.770	0.141	0.339
EG -> GG -> RD	0.094	0.063	1.494	-0.029	0.218
ET -> GG -> RD	0.042	0.058	0.729	-0.071	0.156

Note: Electricity Distribution = ED, Good Governance = GG, Rural Development =RD, Electricity Generation = EG, Electricity Transmission =ET

Hypothesis 12: The relationship between Electricity Distribution and RD is mediated by Good Governance, as represented in table 4.10 with a path linking ED -> GG -> RD. The mediating effect of good governance in the relationships in-between electricity distribution and RD is statistically significant with a t value ($t = 4.770$). Thus, in accordance with the rule, the hypothesized mediating relationship is supported at the level of significance of 1%, as revealed by the result.

Hypothesis 13: The relationship in-between EG and RD is mediated by Good Governance. As shown in Table 4.10, the mediating effect of good governance on the relationships in-between EG and RD is depicted by EG → GG → RD. It reveals no evidence of mediation, as there is no statistical significance in the mediating relationship with t value ($t = 1.494$). Hence the hypothesized relationship for the study was not supported.

Hypothesis 14: The relationship between Electricity Transmission and RD is mediated by Good Governance. As shown in Table 4.10 that the mediating effects of good governance on the relationships in-between electricity transmission as well as RD are depicted by ET → GG → RD. Similarly, the result reveals no evidence of mediation with a t value ($t = 0.729$) which, according to the PLS-SEM rule, is not statistically significant and, therefore, was not consistent with the hypothesized relationship specified in the model.

4.6.3 Coefficient of Determination (R-squared)

The coefficient “of determination R-squared (R^2)” refers to the structural model assessment, which signifies the quantity of variance in the dependent variable cooperatively reported by the independent variables (Hair *et al.*, 2012). The measure explained the variance of the dependent variable in percentage that has jointly emerged because of the independent latent variables, meaning both the combined effects of independent latent variables and the dependent variables. This has justified the PLS-

SEM's use to maximize the R^2 of a model to account for predicting the endogenous latent variable (Chin, 1998, Hair *et al.*, 2016; Lei & Chu, 2015)".

Table 4.12

Coefficient of Determination (R^2)

Constructs	R Square (R^2)
GG	0.47
RD	0.35

Despite " R^2 value Ranges from 0 to 1. The greater the value of R^2 , the higher the percentage of that variance of the dependent variables explained by the combination of both independent variables. According to Chin (1998), R^2 values of 0.19, 0.33, and 0.67 are considered weak, moderate, and substantial, respectively. Hence, from the model of this research, the R^2 value of 0.353 (35.3%) were found and indicating that the independent variables: EG, ED, ET, and GG that where been treated previously as an exogenic variables in the model grouped and accounted for 35.3% of the variance in the dependent variable RD. This indicated that a substantial variance explained was acquired (Chin, 1998). Relatedly, EG, ED, and ET were treated as independent variables against GG as the dependent variable, with the independent variables jointly accounting for 47.2% of the variance of the dependent variables. This also signifies a significant variance explained (Chin, 1998).

4.6.4 Effect Size Assessment

Apart from assessing “the combined effects of exogenic latent variables on the endogenous construct, this study also evaluated the impact of each of the exogenous latent variables on the effects of the endogenous constructs. Thus, the measure has been referred to as what is known as effect size (f^2), which specifies the relative of a specific exogenous latent variable on the latent endogenous variable (Hair *et al.*, 2014). It also measured the change in R^2 value due to the deletion of the construct and assessed whether that deletion of that particular exogenous construct had exerted a substantive effect on the coefficient of determination (R^2) of the endogenous constructs (Shanmugapriyam & Subramanian, 2016). likewise, effect size (f^2) indicates the practical contributions of the path that links an exogenous construct to the endogenous (Preacher & Kelley, 2011). Subsequently, the effect size has been measured using Cohen’s formula computed automatically in the smart PLS3 (Cohen, 1988; Ringle *et al.*, 2015). In that PLS-SEM model, the effect size (f^2) effect of an exogenous construct is suggested to be small, medium as well as substantial at 0.02, 0.15, and 0.35 respectively” (Cohen, 1988).

Table 4.13 indicates the f^2 of the entire exogenous constructs from the PLS-SEM outcomes using the survey data. As noted from this table, the exogenous variables recorded significant or positive effects on the dependent variable in-between the small to medium effect on the dependent variable”.

Table 4.13:
Constructs Effect Size

Endogenous	Exogenous	f-Squared	Effect Size
RD	ED	0.000	None
	EG	0.000	None
	ET	0.025	Small
	PW	0.010	None
	GG	0.152	Medium
GG	ED	0.183	Medium
	EG	0.024	Small
	ET	0.005	None
	PW	0.001	None

As presented in Table 4.13, the effect sizes for the electricity distribution, EG, electricity transmission, political will, and good governance on RD were 0.000, 0.000, 0.025, 0.010, and 0.152, respectively. Hence, following Cohen's (1988) rule, the impact sizes of these five exogenous variables on RD can be considered as none, none, small, none, and medium effects, respectively. Furthermore, Table 4.12 also showed that the effect sizes for the electricity distribution, EG, electricity transmission, and political will on good governance be 0.183, 0.024, 0.005, and -0.001, respectively. Similarly, based on Cohen's (1988) guideline, the outcomes have suggested the effect sizes of those 4 exogenous variables on good governance can be regarded as medium, small, none, and none, respectively. It is important to note that a small f^2 does not essentially indicate an insignificant effect (Limayen, Hirt & Chin, 2001).

4.6.5 Predictive Relevance Assessment

This blindfolding“method has been used to achieve the Stone- Geisser’s Q^2 and assess the model's predictive quality. Tenenhaus (1999) recognized that a positive value of Q^2 signifies the model has predictive validity; also, a negative outcome indicates that the model does not have predictive validity. Scholars like Hair *et al.* (2011) suggested that the model will have a predictive quality as long as the cross-redundancy rate is greater than zero. But, if values were less than zero, then it means that the model is deficient and lacks predictive relevance; else, the projecting relevance of the model will not be acceptable. Chin (1998) and Hair *et al.* (2014) outlined thresholds in assessing the strength of the Stone- Geisser’s Q^2 , which are 0.02, 0.15 as well as 0.35 and represent small, medium, and large predictive relevance. Also, in applying the blindfolding procedure on the endogenous construct (GG and RD) with SmartPLS version 3.2.7 with an omission distance of 7, Stone- Geisser’s Q^2 has been computed. Table 4.13 indicated cross-validated redundancy of 0.247 for GG and 0.163 for RD. The outcome affirmed that the model has a medium predictive quality” of 0.247 on GG and 0.163 on RD.

Table 4.14
Predictive Relevance of the Model

Construct	SSO	SSE	$Q^2 (1-SSE/SSO)$
GG	2364	1778.331	0.247
RD	4728	3957.172	0.163

4.7 Summary of the Chapter

In line with the above, the chapter has reported frequency in analyzing the usage of the demographic information, including gender, age, marital status, occupation, educational qualification, income before electricity, and income after electricity. Also evaluated and reported was the reliability criterion, such as the internal consistency reliability, which gives information concerning the relationship between the individual items in the scale. Apart from that, PLS analysis was carried out to examine the in-between relationships independent, moderating, mediating, and dependent variables. Table 4.15 reveals the summary of the hypotheses and the decision/remarks.

Table 4.15
Summary of Hypotheses

Paths	Beta	STDEV	T Statistics	P Values	Decision
EG ->RD	0.029	0.062	0.462	0.644	Rejected
ET -> RD	0.205	0.065	3.174	0.002	Accepted
ED ->GG	0.475	0.050	9.448	0.000	Accepted
EG ->GG	0.186	0.063	2.958	0.003	Accepted
ET -> GG	0.084	0.058	1.442	0.150	Rejected
ED ->RD	0.012	0.068	0.182	0.856	Rejected
GG -> RD	0.505	0.055	9.269	0.000	Accepted
PW -> RD	0.117	0.056	2.101	0.036	Accepted
ED*PW ->RD	0.056	0.066	0.850	0.396	Rejected
EG*PW ->RD	0.038	0.072	0.534	0.594	Rejected
ET*PW ->RD	0.138	0.074	1.850	0.065	Accepted
ED -> GG -> RD	0.240	0.050	4.770	0.000	Accepted
EG -> GG -> RD	0.094	0.063	1.494		Rejected
ET -> GG -> RD	0.042	0.058	0.729		Rejected

CHAPTER FIVE

QUALITATIVE DATA ANALYSIS

5.1 Introduction

The previous chapter analyzes the quantitative aspect, which comprises research questions one, two, and three through administering questionnaires collected from the field. The data were meticulously screened and analyzed for all the variables. Based on the face-to-face interview, chapter five analyzed qualitative data Using content analysis. The coding captures the major impacts of EI regarding the RD, particularly in Niger State. It represents the first theme of the qualitative data and answers research question 4 with 2 subtopics. Challenges of EI are the second theme, and it responded to research question 5 with sub-themes. The last theme is the strategies recommended by the informants to address the challenges of electricity in the rural areas of the State.

5.1.1 Interview Protocol

The concept protocol in this study is a procedural that enables the interviewer to know how to ask questions and knows the right questions to ask vis-a-vis to gain in-depth information from the electricity stakeholders, government officials, and experts to guide the decisions in this study. Interview Protocol is a framework that spelt out the

Procedure and approaches for conducting interviews. Some of the approaches include the followings.

5.1.2 Interview Guide

Before the beginning of the interview, the researcher developed a flexible script (questions) to accommodate changes during the interview session and avoid neglecting vital information from the interviewee. Although the questions were not read word for word, it guided the researcher to track the questions sequentially in order of their importance carefully. The information in the script helps the interviewee understand their rights as a person being studied and ensures a decent manner of conducting research.

5.1.3 Consent of the Interviewees

The researcher officially sent a letter of consent with attached photocopies of the approval letter from the Ghazali Shafie Graduate School of Government, Universiti Utara Malaysia, Sintok, to the interviewees seeking their consent and valuable time to interview the effects of EI on RD. Approval was granted through various mediums, such as telephone calls, short notes, and verbal messages.

5.1.4 Interview Location

The location of the interview determines its quality. Video or audio recording in a noisy environment is vulnerable to background noises which will negatively affect its quality. The choice of location by the interviewer or the interviewee is a good feature of a quality interview (Jaffe, 2011). A comfortable place suggested by the interviewee will give them the feeling of ease to respond assertively. Questions were developed as

a guide for the semi-structured interview sessions concerning the impacts of EI and RD Niger State. The questions cover stakeholders' perception, electricity consumers on EI and strategies to improve the infrastructure. The interview was mainly open-ended in nature in their various offices. The responses of the participants were audiotaped with their due consent.

5.1.5 Neutrality and Courteous

An interview is a standard approach for collecting data. The various qualitative Interviewing methods universally used emerged from various disciplines with guided ethics (DiCiccoBloom & Crabtree, 2006). To sustain the ethics and curtail bias, the researcher maintained a high degree of neutrality while conducting the interview and assured the interviewee that the issues discussed would be handled with paramount confidentiality. Interview ethics such as courteousness were considered to uphold the relationship between interviewer and interviewee.

5.1.6 Recording, Coding, and Reporting

To pay attention and maintain contact with the interviewees, the researcher used a recording device (audiotape and videos) and also took notes of nine (9) interviewees on their perceptions of the effects of electricity on RD in the State (Jacob & Furgerson 2012). In the same vein, to ensure accuracy, the researcher transcribed the audiotaped responses of the interviewee into Transcript-Based Analysis (TBA) text as opined by (Krueger, 1994).

Coding and themes are used interchangeably (Joffe & Yardley, 2004). “Coding entails the logical process through which data are broken, conceptualized, and integrated to form a theory. On the other hand, theme highlights, pinpoint, probe, and record key points within the data collected. Content analysis is the most common method of analysis in a qualitative study. The researcher began the analysis by coding the transcribed data to identify the key point from the larger text into a more precise form. Content analysis cut- across data sets that were relevant and related to research questions four and five of this study. In reporting this study, the researcher emphasized the original views of the participants. However, we inevitably edited the word's usage, which might affect the original meaning or comprehension of the message or confuse the readers (Bloor, Frankland, Thomas, & Robson, 2001). We equally adopted comparison approaches to deduce meaning from their responses and contextualized the explanation of participants by identifying hints or clues from the context of the discussion. For easy comprehension of qualitative data, content analysis was carried out using six guides (Clarke & Braun, 2013)”.

The table below highlights the steps and actions taken by the researcher in the course of collecting and analyzing data qualitatively. The table also briefly explains the steps to guide the readers.

Table 5.1
Stages of Thematic Analysis

S/NO	Stages	Description of the procedure
1	Data familiarization	Read the transcribed data over and over to get acquainted with major ideas
2	Initial code generation	Identify the major elements of the transcribed data
3	Explore/identify the theme	Assemble codes into the potential themes; collect all data relevant to each theme
4	Review the theme	Review to ensure themes agrees with the code
5	Define and label the theme	Generate clear definitions and name the theme
6	Report	Relate the theme to the research question and phenomenon under study

Source: Clarke & Braun, 2013

5.2 Demographic data

The study analyses the opinions of nine (9) informants for the interview conducted. Pseudonyms were used throughout this thesis, with the actual names of informants preserved. Hence, the duo was represented in the study as “informants” based on the burden of a pledge made to maintain a high degree of confidentiality of the 2 interviewees strictly and respect their anonymity. To distinguish among the anonymous informants, 9 stakeholders were tagged as informants STKHDI-STKHDI to represent political stakeholders, while EO1-EOIII represents Electricity officials, and HH1-HHIII represents Households. For the emphasis' sake, Prolonged

and extensive responses by the informants were italicized, and brief/short explanations were distinguished from the main discussion with quotation marks (APA, 2001). The table below discusses the biographies of the informants interviewed in the course of conducting this study. This is necessary to acquaint the reader with the information about them and to understand their nature

Table 5.2
Summary of Demographic description of the informants

Informants	Frequency	Percentage
Gender		
Male	6	66.7
Female	3	33.3
Age		
18 – 45	5	55.6
46 and above	4	44.4
Qualification		
Secondary	-	-
Tertiary	9	100
Residence		
Rural	3	33.3
Urban	6	66.7

Source: Researcher

5.3 Perception of Informants on Electricity Infrastructure in Niger State

Perceptions of the informants provide an answer to the fourth research question. The term is conceived as self-appraisal of the impact or value of a program(s) as perceived by its primary users. On the other hand, it is a process by which the stakeholders and electricity consumers translate the benefits of the infrastructure into an understandable interpretation. In this context, perception is equated with reality in the entire activities of EG, transmission, and distribution on the development of rural areas in the State.

The essence of assessments is to know the reactions of particularly the electricity consumers on their general socio-economic status, especially income earnings during the period under study

Perception of the informants is abroad expression that emerged after we considered merging several related themes concerning EI. Some of the themes clustered to form broad themes, sub-themes, and sub-sub-themes are social and economic views that cover the connection of electricity to the national grid and stable supply of power vis-à-vis how it translates to RD. The perception covers the following question:

- i. *In your perception, what are the major successes of EI in the rural areas of Niger State during the period under review (1999 to 2015)?*
- ii. *In your opinion, how do you evaluate EG, transmission, and distribution in the rural areas of Niger?*

5.3.1 Connection of Rural Areas to the National Grid

Rural areas in Nigeria, just like the USA, are defined as locations that have a population of less than 50,000. They are also classified as areas where there is a group or collection of less than 2,500 to 50,000 people. Living in rural areas presents a unique set of challenges that citizens who live in larger cities do not often face, especially in terms of utility services like electricity.

Ferragina, Tomlinson, and Walker (2013) acknowledged that in a democratic dispensation, people should determine what will be done for them and be allowed to appraise their performance, not a few individuals' opportunists imposing their egocentric interests on the citizens. By accepting more inclusive responsibilities, the

notion of top-down imposition of the unfavorable intervention program(s) may be overturned and consequently inspire politicians to improve the general activities of their policies and programs (Sabo Ahmad, Abdullah, & Arshad, 2015).

5.3.2 Manual Result Analysis

In summary, the first theme explains the perception of informants on EI in Niger State. On the other hand, the sub-themes are the connection of rural areas to the national grid and the government's contribution to EI. The sub-sub themes emphasize the social and economic impact of electricity on the target beneficiaries in the rural areas of Niger State,

Based on the above assumptions, this study interviewed the informants on the significant successes of EI recorded within the various rural areas in the State during the period under review (1999 to 2015). Stakeholder one reveals that:

“In the effort of the state government to support the Federal Government’s commitment to ending electricity poverty vis-à-vis fulfilling their campaign promises of “electricity for all” they have connected and commissioned over 100 electrification projects across the communities in the local governments of the state since the return of democracy in 1999.(STKHDI).

Confirming the above submission, another stakeholder affirms that:

“We are getting closer to our goal of ensuring that living standards are improved using clean, safe, and reliable sources of power. Our agency Rural Electrification Board (REB), is dedicated to ensuring the distribution of electricity equally to various communities using rural electrification grants. (STUDIO).

In the same vein, one of the electricity officials in the Rural Electrification Board (REB) reveals that:

Before 1999, less than 60 % of 25 local governments were connected to the national grid. However, with the state government's commitments through its agency Rural Electricity Board (REB), all the local governments have been connected to the national grid (EO I).

Corroborating the above claims, the households interviewed from different senatorial districts affirmed that their communities had been connected to the national grid through the state government's efforts. For instance, households and inhabitants of Saminaka, Wawa, and Tafa communities in the three (3) senatorial zones indicated the presence of electricity in their respective communities. Expressing admiration, one of the households acknowledged that

"The absence of the light for some years now drove most of the youths in the community to neighbor and other far cities and towns, but now I am very optimistic that those who left will come back due to the existence of the light, and I believe we will see a new vibrant life in our communities." (HHII).

In addition, HHIII affirmed that:

"The newly installed electricity will put an end to the community's hardship. Electricity leads to economic prosperity. The people of this community now have power for productive uses. Businesses will thrive, and education will improve. We can now move beyond the days of darkness. With this, we are indeed grateful."

During the interview, one of the passers-by angrily interrupted the process stating that:

"Electricity connection is more of a political gimmick than a reality. I don't know about other communities, but we did not benefit from electricity, especially for those of us in the opposition party. We have not benefitted from the program I mean, we are politically marginalized."

Augmenting the feeling of support, his companion reiterated as follows:

I concur with the submission of my brother. Although there was a move by the government to take us along (Formation of unity government) after the election, unknowingly that it was a political gimmick to calm the heat of the election. In other words, the electricity project is purely on political patronage.

In another narration, the households interviewed asserted that:

The electricity demand in Nigeria and Niger that hosts the power plants far outstrips the supply the supply is epileptic in nature. The state is faced with acute electricity problems, hindering its socioeconomic development, notwithstanding the availability of vast natural resources in the state. It is widely accepted that there is a disconnection between socio-economic development and the availability of electricity in all the rural areas of Niger. (Household I, II, and III).

Any society's successes in socio-economic development (e.g., electricity, water, health, recreational centers, among others) are anchored on a steady power supply. Economic infrastructure is part of an economy's capital stock that produces services to facilitate economic production, serves as inputs to production, or is consumed by households (e.g., water, sanitation, and electricity). In the same vein, social infrastructure encompasses services with direct and indirect impacts on the quality of life in both rural and urban centers. Directly, it supports production and trade; indirectly, it streamlines activities and outcomes such as recreation, health, and safety, respectively. One would therefore deduce from the above submissions that the epileptic nature of electricity supply to the rural areas would negatively affect the socio-economic activities of target beneficiaries.

5.3.3 Contribution of Government to Electricity Infrastructure

Until recently, the Nigerian Government has been involved in electrical installations, power generation, and distribution. Specifically, the National Electric Power Authority (NEPA) and the Power Holding Company of Nigeria (PHCN) have enjoyed an unrestrained monopoly in power generation and distribution in Nigeria. Similarly, the Nigerian Electricity Regulatory Commission (NERC), a self-regulating body, is charged with authority for the regulation of the electric power industry in Nigeria. NERC was formed in 2005 through the Electric Power Sector Reform Act 2005 for the formation and review of electricity tariffs, transparent policies regarding subsidies, promotion of policies that are efficient and environmentally friendly, and also including forming and enforcing of standards in the creation and use of electricity in Nigeria. NERC was instituted primarily to regulate the tariff of Power Generating companies owned or controlled by the government and any other generating company which has a license for power generation and transmission of energy and distribution of electricity, among others (Okafor, 2018).

NERC's "primary duty is to protect the interests of consumers, issue licenses to operators/investors, set and review electricity tariffs and, where possible, promote competition. The Commission's main objective is to protect existing and future consumers' interests concerning electricity generated and conveyed by distribution or transmission systems. Consumers' interests are their interests taken as a whole, including their interests in affordable tariffs and safe, reliable, and available electricity supply, and the reduction of greenhouse gases to them (Okorie, 2014). In light of the

above, this study assesses the government's commitment" toward EI in the State.

Briefing the researcher, a stakeholder stated that:

"Prior to 1999, the power sector did not witness considerable investment in infrastructural development. Throughout that period, new plants were not constructed, and the existing ones were not well maintained, bringing the power sector to a terrible state. In 2001, generation went down from the installed capacity of about 5,600MW to an average of about 1,750MW, compared to a load demand of 6,000MW. Also, only nineteen out of the seventy-nine installed generating units were in operation"(STKHD I).

In the same vein, one of the stakeholders contended that even though the government has committed resources to the electricity, the lack of appropriate policy, the regulatory and institutional framework to stimulate demand and attract investors have greatly affected the EI and the development of Niger rural areas.

On the contribution of government to the EI:

....it is better seen than imagined, Sir, since the commissioning of our electricity, we have never seen the light again. Several complaint letters were sent to the government, but nothing... I repeat, nothing has been done about our electricity. We were told that during the commissioning ceremony, they used a generator... there was no evidence anyway (HH III).

Corroborating the above claims, a study reveals that "currently only 40% of Nigeria's population is connected to the energy grid at the same time as power supply difficulties are experienced around 60% of the time. At best, the average daily power supply is

projected at four hours, although several days can go by without any power at all (Oluwasegun,2015).

According to an anonymous staff of the Ministry of Works and Infrastructure, inefficiencies in the power sector necessitated the 2005 reforms, which focused on privatizing the generation and distribution assets and encouraging private investment in the power sector. The government continues to control transmission assets while making "modest progress" in creating a regulatory environment attractive to foreign investors. Despite this effort, minor increases in the average daily power supply have been reported (Anonymous, 2019).

It might interest you to note that presently Nigeria uses four different types of energy: natural gas, oil, hydro, and coal. The energy sector is profoundly relying on petroleum as a method for electricity production, which has sluggish the development of alternative forms of power supply in Nigeria and particularly in Niger State, which has three hydroelectricity generating stations.

Going by the above submission, one would deduce that government plays insignificant role towards the development of EI.

5.4 Challenges of Electricity Infrastructure in Niger State

Just like other developing countries of the world, Nigeria's electricity problem is not one dimensional, as over the years, several reasons have combined to impose a multidimensional burden on the country's power generation and distribution potential.

In recent years and age and with all the endowed natural resources Nigeria is blessed with, it mystified the clear-thinking individual why the country is still at the megawatt generation stage and why it has not entered the terawatts realm or even into the business of Selling electricity to other African nations? It appears that the vision of the country's leadership is trapped in the 1970s mind frame, oblivious of the exponential increase in population and socio-economy”.

To answer the fifth research question, this section emphasized the challenges confronting EI that affect the development of rural areas in Niger. The challenges were expressed by a cross section of stakeholders in the Ministry of Works and Infrastructure and electricity consumers (households). The interviewees identified institutional problems as major challenges, which mainly include poor generation, gas supply, transmission and distribution etc. ...the operational capacity of the power, unceasing sabotage and vandalism, political challenge, general policy, and sincerity of purpose.

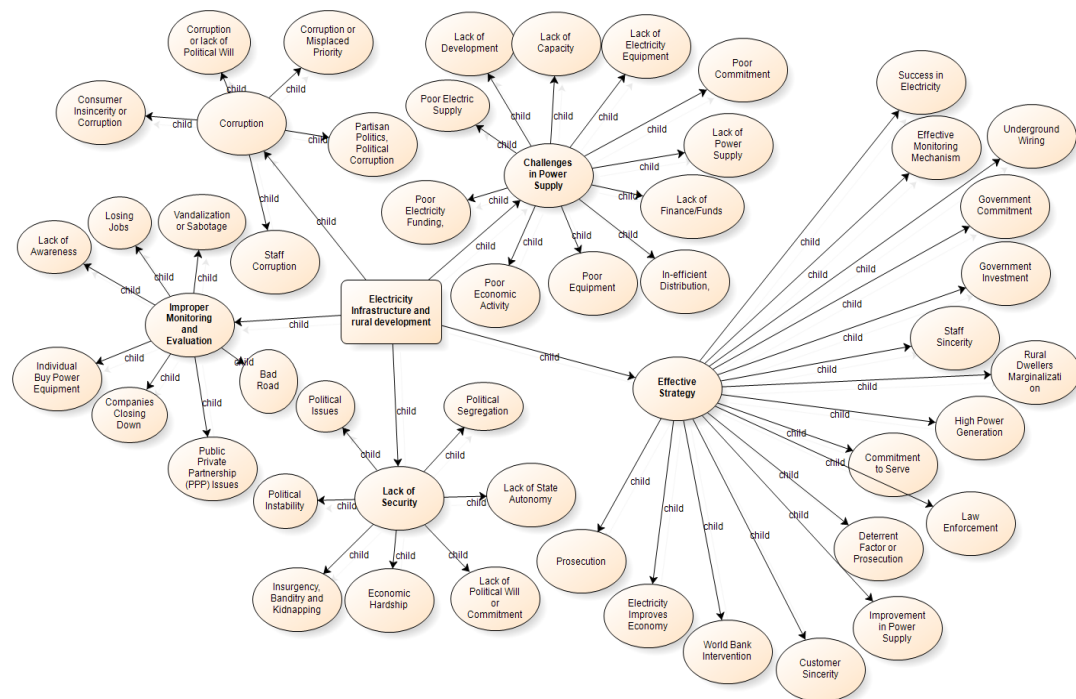


Figure 5.1
Challenges and Strategies of Electricity Infrastructure

To answer the fifth research question, this section emphasized the challenges confronting EI that affect the development of rural areas in the State. The challenges were expressed by a cross section of stakeholders in the Ministry of Works and Infrastructure and electricity consumers (households). The interviewees identified institutional problems as major challenges, which mainly include poor generation, gas supply, transmission and distribution etc. ...the operational capacity of the power, unceasing sabotage and vandalism, political challenge, general policy, and sincerity of purpose.

5.4.1 Institutional Challenges

An institutional pattern of any organization, public or private, requires an effective structure to achieve viable economic growth and RD. Institutional Settings are very crucial as they determine the success or failure of a program or policy (MucuNigeruzi, 2011). In this study, institutional factors emerged as a general theme after carefully integrating several related sub-themes concerning EI and the development of rural areas in Niger. Thus, after careful study of the transcript, we identified sub-themes to include lack of gas supply, transmission distribution etc. ...the operational capacity of the power, fiscal challenges, unceasing sabotage and vandalism political intervention, general policy, sincerity of purpose.

According to one of the stakeholders in the ministry of works and infrastructure:

“The power sector in Nigeria and particularly in Niger is beleaguered with structural issues in major areas like generation, gas supply, transmission, and distribution etc. ...the operational capacity of the power plants is less than a third of their installed capacity. Unceasing sabotage and vandalism have crippled oil and gas pipelines, creating gas shortages at power plants. Other problems include underinvestment in maintenance and infrastructure has constrained our transmission grid. Finally, high collection and commercial losses have impacted the financial viability of the privatized distribution companies”(STKHD I)

Similarly, another stakeholder opines that:

...the electricity department is poorly equipped and ill-motivated to carry out minor maintenance of electricity problems in the rural areas. ... Some of our bosses do not help matters as there are times pocket funds earmarked for maintenance of minor electricity

problems and in-turn charge the communities. By implication, corruption has been the major Challenges confronting this unit (STKHD III)

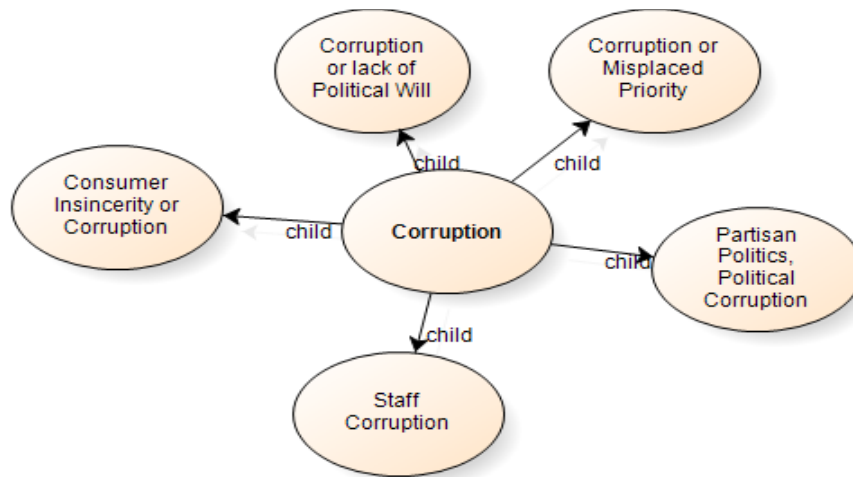


Figure 5.2

According to an informant, *“I will let you know that generally our problem in this country if we want to be fair, is corruption. And this corruption is mostly on the side of, I'm sorry, you on the side of government.”* (EO3 MS). *“In other communities close to us, they don't even have the lights because they said they voted for the opposition party, infect they are not even connected to the national grid yet, and their offence is that they voted the opposition party, instead of the ruling party. I am a stakeholder”* (SSA to GVT).

Corroborating the above, SSA affirmed that: *“The government is corrupt. The electricity officers are corrupt. So, you hardly found where there is no corruption in Nigeria, but we are hoping and praying for better.”* (SSA to GVT). In addition, Corruption is everywhere. Seriously, we need to be prayerful and to be hopeful that in

the future, the country will be a better place for our children and children yet unborn. Well, electricity was better than this before, but now, it's very, very poor because sometimes we spend a month almost without light, and they are giving us light six hours because they are Sharing. It has been rationed, and within these six hour, it is off and on. If we calculate at the end of the day, the hours that they give us light, it like three hours and sometimes none”. (SSA to GVT).

More so, another informant added that “And so on the issue of corruption, yes, I know corruption is not only in the electricity sector, but Nigeria as a country corruption has eaten deep, you understand such corruption, and you should understand that in every government establishment, I cannot deny that there is no corruption. We are also doing our best to see how some of this corruption can be reduced to the barest minimum because you cannot totally do away with it. We have not gotten to that level.

For the issue of corruption, there is corruption. What I can also assure you about this 16 billion you are talking about during the administration of Obasanjo. They imported heavy structures in terms of electricity and then left it to the next administration left it at the airport so that they have not moved because where they are supposed to take these things to fix them, there is no even better road to that place (Informant).

In the same vein, anonymous personnel in the ministry confided to the researcher that the core of Nigeria’s problems and particularly our ministry, “stem from mainly poor policy initiatives over the years by the governments with regards to expanding the sources of electricity, overloading the current grid, a non-existing asset protection

mechanism for the safety of power generation/distribution equipment like pipelines and plants and finally a very poor maintenance culture among others.”

Furthermore, an electricity official from Abuja Electricity Distribution Company, Minna regional office reveals that:

“Government is inconsistent and misguided power reform policies; ...inefficiency in power generation, transmission, distribution, and consumption; and the incompetent workforce of the energy companies are major challenges of electricity supply in Niger and have greatly affected the socio-economic activities of the rural populace”.

This “finding is in line with the study of Elusakin Olufemi, Diji and Chuks (2014). according to them, the erratic power supply by Power Holding Company of Nigeria has not only forced the urban dwellers that are presumed to have more access to electricity than their rural counterparts to a similar fate of the rural dwellers. Power supply challenges cripple the agricultural, industrial, and Mining sectors. These impede Nigeria's economic development, especially in Niger's rural areas. The energy supply problem is complex, stems from a variety of issues and has been ongoing for decades. Most Nigerian businesses and households that can afford to do so run one or more diesel-fueled generators to supplement the intermittent supply” (Elusakin, Olufemi, Diji&Chuks, 2014).

5.4.2 Sincerity

Successive governments in Nigeria, particularly in our study area, 'Niger State,' have made several efforts to address the challenges of EI. Perhaps, the sincerity of purpose in implementing these programs has been questioned by many informants during our field study. This made people to be apprehensive and skeptical about the government and the possibility of RD through EI in the State.

The erosion of public trust in government resulted from the illicit activities of those entrusted with resources of the state (Fried & Harris, 2015). Identifying the Challenges of EI, an informant observed that "...government officials were not sincere in allocating resources to steady supply of power. There are issues of diversion of resources to personal accounts, friends, or relatives...". He added that "...electricity will be stable if stakeholders change their corrupt attitude and sincerely allocate resources to the electricity project". ...that "on our own side we will put out an effort to see that we will distribute as much as possible that we can distribute to attend to the people fairly. And they on this side of the consumer as well."

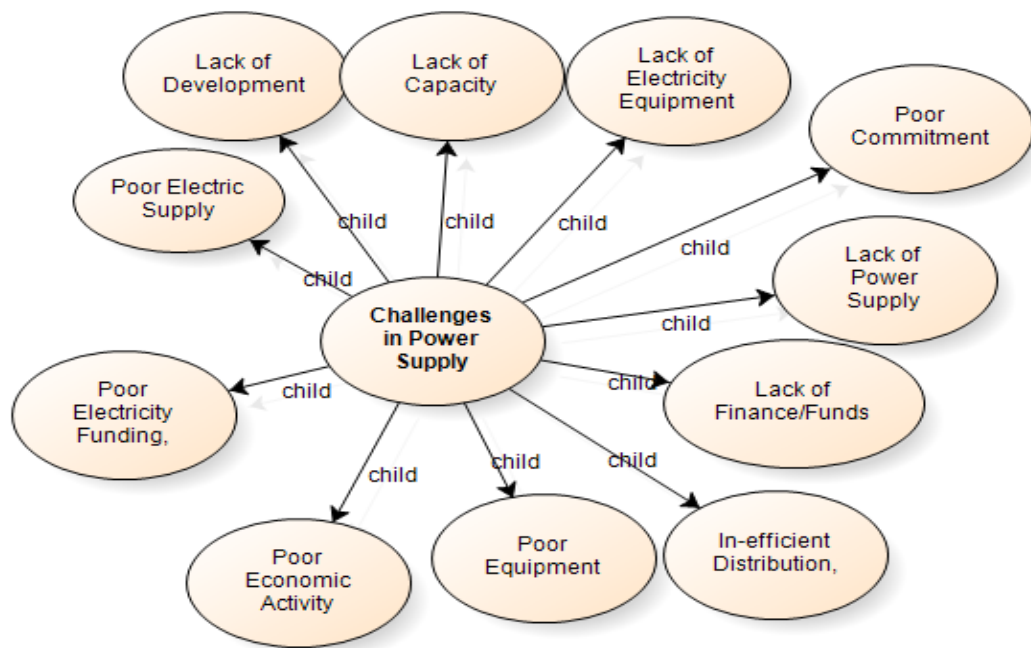


Figure 5.3
Challenges of Electricity Infrastructure

In the words of an informant, “I believe some of the major challenges are lack of planning, Technology gap is another major challenge operational challenges, which are fundamental business for the abandonment of many of grid, power project in Nigeria and most, especially in Niger. I think those are the major challenges.”“but even though there is a lot of effort by the government to make sure that electricity is improved, there are many problems in that respect.

Part of the problem we are having in the rural area is that there are a lot of machines that use electricity, such as grinding machines for cooking food such as millet, maize and many others that are using electricity on their machine and most infrastructures that are using power are not improving, especially in the area where developers are also lacking, their backwardness in the regions that are using such machines for

economic development that is why there is a lot of poverty in such areas because electricity is not available if electricity is available there are no small scale businesses.” HH 2, number two, there are a lot of challenges maybe when we talk about the poles because we are using surface poles, not underground ones, so whenever there is rainfall in many areas, poles would fall down as a result of that, there would be no electricity in such places because even if there is light immediately when poles fail down the light will go up, so that is also one of the challenges,” HH2

“One of the problems in that respect is that some of the poles are not strongly made, some are made from wood, the wood would break down if there is Strong wind there will be a lot of problems to that respect. The equipment like transformer, poles and wiring can be of low quality and how old are they? Are they new ones? Some are not new because some are even older than my age, so at least from that, you know that there are many problems that have existed for over 40 years. Yes, and they are still thereHH2

In the same vein, an informant submitted that “...government has not been sincere to truly sustain stable electricity because they own over 90% of companies that sell generating plants across the thirty-six states of the federation “...it has been reluctant to provide logistics to the personnel in charge of bills. This has pinned us down to effectively discharge our duties” “...we find it very difficult to recover the monthly bills because most stakeholders, politicians or their relations are major defaulters.

In essence, for adequate provision of EI in Niger State, the sincerity and integrity of the stakeholders that dispenses the responsibilities must not be disputed. This is because "... once peoples' representatives lack these qualities (integrity and sincerity), the citizens will establish cynicism over their sincerity and commitment to the implementation of the programs" (E.O I and III). Thus, the objectives of the programs will be defeated. Government stakeholders should therefore be objective in regaining their lost glory from the citizens. Accordingly, a study highlighted that Nigeria's policies and programs were introduced with good intentions. However, implementation has always been an up-hill-task for the government and its agencies. Reasons for these failures include corruption and lack of sincerity of purpose (Agba, Attah, & EboNiger, 2015).

5.4.3 Fiscal Challenge

In this context, the term fiscal challenge refers to the financial constraints confronting the effective implementation of EI in the state's rural areas. Organizations require adequate funds to survive and to execute their routine activities effectively. On this premise, a substantial budget is prepared and approved by the parliament and the executive, respectively, for all the proposed projects within one fiscal year. Despite the annual budget and even supplementary budgets, policy makers persistently attributed poor implementation of the policies to financial challenges.

Informants have varied perceptions of financial constraints as a challenge of EI in Niger

Expressing a bitter experience of financial constraints as one of the factors that threaten electricity in Niger State, he disclosed that:

...most of the resources allocated for electricity projects are, in most cases, re-allocated for political parties' activities. Thus, we have insignificant funds to execute any meaningful project(s). As career civil servants, we do not have the authority to question political officeholders if we genuinely want to remain in the service (STKHD II).

The above explanation seems to be the root cause of poor electricity supply in the state because it is a tradition that the state governments make provision for all its projects budgets, yet, the Niger state government does not have the political will to execute its infrastructural obligations (Dimelu et al., 2015).

Highlighting the causes of the problem mentioned above, an official of the state stated that:

The State Government is financially crippled and unable to fund its programs because of wide-ranging acts of corrupt enrichment, extravagance disbursement on imaginative projects (nonpictorial projects) and sheer misplacement of priorities at the detriment of its official programs. For instance, hosting a carnival does not make any impact while citizens are in darkness. We can therefore conclude that the state is the architect of its current misfortune and erratic power supply (HH I. II and III)

In the same vein, another electricity consumer further accentuates that:

...programs mainly designed for EI are gradually becoming poverty enhancing programs due to politicians' philosophy of self-

enrichment or primitive accumulation of wealth and immoral social ethos, which account for the failure of power supply in Niger. (Electricity consumer).

“The level of staff training in this unit has been discouraging. We need periodic training to acquaint us with the new skills of the workforce, targeting electricity skills to meet the organization's needs for now and in the future, as well as strengthen better customer relations and enhance safety practices and productivity improvement” (EO III).

Similarly, a household avers that:

.... electricity problem in Nigeria is one of the factors for the high poverty level. Due to a lack of electricity, many entrepreneurs cannot grow at a reasonable pace, often running into financial problems before Seeing a little profit. For instance, a common man who is into welding on the street cannot work at a consistent pace due to the lack of electricity. In most cases, most artisans who need electricity but cannot have it either exhaust most of their earnings fueling a generator or become Okada riders. This, in turn, is the metaphor for the common man's dilemma. It means that the common man will have to struggle for life and against untimely death. The common man struggles with life in the sense that he will have to look for money to feed himself and his family in the face of lion conditions the Nigerian government has subjected him to (HH I, II, and III).

As a result of the cumulative effects of the power supply's weak financial base, a scholar remarked that a paucity of funds could further metamorphose into longlasting poverty, trapping of the destitute or impoverished people (Gennetian & Shafir, 2015). Therefore, it is sufficient to caution that the degree of success of any policy is mainly contingent on sufficient funds and realistic implementation, the manager's disposition coupled with their enthusiasm and determination to manage the resources.

5.4.4 Political Challenge

Playing politics in implementing EI impinges good governance practices and raises the poverty threshold in the rural areas of developing countries like Nigeria (MucuNigeruzi, 2011). Allocation of resources based on political consideration tends to give undue advantages to politically connected persons and groups to the detriment of the target society (Verba, 2015). The issue of political patronage in allocating public resources affects the power supply. This scenario is perceived differently in different ways by different informants.

Relating his ordeal, a household assert that:

“One of the challenges of this government on electricity supply is discrimination... a situation where the connection of rural communities to the national grid is politically linked. Many of the beneficiaries were chosen for political reward”. Similarly, “...poor culture of managing public resources, coupled with a high degree of political discrimination is a major social dislocation that has perpetuated RD and limited the capacity of government to engineer development in Niger (HH III).

Avgerou (2008) stressed that insufficient resources, lack of political commitment, poor maintenance culture, and shortage of infrastructure are among the main problems of sustainability of government programs and policies in developing countries. On the contrary, an informant perceived “paucity of resources as not an issue because Niger State has enormous resources to develop the state but was left idle and the few explored are not impacting on the citizens due to corruption among politicians and civil servants.”

In his word, the electricity beneficiary stated that the... challenge Confronting EI first is the issue of corruption. Secondly, political will, third ineptitude, fourth incompetence, fifth Nepotism... are the idea challenges. They're just the problems in Nigeria because if you don't have the political will to act in such a way that this what we have, you know,”.

Similarly, an informant reveals, "A lot of people have amassed wealth, but because we don't have the political will to administer justice, everybody is found at fault. So, these are the challenges of not applying the rule of law, no obligation to do to have the law. It's all and sort of the major challenges. “The issue of EI challenges in Nigeria is the issue of corruption. We keep mentioning this corruption, corruption, corruption. It has enveloped the entire EG policies in the country, ensuring that money meant for such project itself is into the pocket of a private individual.” ...informant.

The study discovered that political influence negates the rudimentary values of good governance practices in the contemporary world and particularly in Niger state and other states of the federation. Politicians decide who to appoint and who to disappoint. While well-connected people were appointed, the disconnected ones were disappointed (Omololu, Bello, & Mbada, 2015).

In line with the above views, it is glaring to note that politicians and political actors influenced the processes of electricity activities. On a general note, a stakeholder disclosed during the interview that most electricity projects claimed to have been executed by the government were not executed until recently after being prosecuted.

The brunt of the issue is that there were no official documents (minutes of meetings, contract award papers to trace project locations, etcetera) to prove the genuineness of the expenditures incurred on the electricity projects from the year 2007 to 2014. A critical assessment of the foregoing views has conveyed that political discrimination accounts for societal polarization, subjugation of the poor in rural areas and the most significant causes of upheavals, the futility of electricity projects and, above all, proliferation and perpetuation of poverty in Nigeria and Niger state in particular.

5.4.5 General Policy Instrument

The Nigerian government has applied several policy instruments to address infrastructure problems. The efficacy of the instruments remains a subject of debate. Stakeholders of some selected ministries, electricity personnel and consumers have divergent opinions on how the policies have negatively affected EI in Niger state rural areas. Generally, the redirection of attention of incumbent leaders for self-succession in power, coupled with impunity for policy deviants and challenges of policy continuity, are some of the policy issues discussed by informants under this sub-theme

According to an anonymous informant, "...I have to be very objective on the ground of anonymity, participation in policy formulation and implementation has not been encouraging as result of political intervention" "...implementation of electricity policy is not transparent, and officials assigned the responsibility of the scheme were not accountable which contributed to lose of huge sums of revenue in the power sector.

Worse still, the culprits were not apprehended because they were members of the ruling party (HH II).

In a more comprehensive analysis, an informant explains that:

The war against poor electricity supply in Niger state has been eluded as political leaders have lost focus in the battle. It is obvious that our leaders started this pursuit with a Stronger drive and passion during political campaigns, but soon after they won the election, they lose focus in this winnable war; their interests were no longer directed towards Liberating the people from the perennial miseries of erratic power supply, because of their egotistic yearnings and aspiration for self-succession in power. I mean, resources meant for EI were diverted for the campaign by the political office holders. Therefore, our major challenge is not only redirecting resources but also redirecting “public policy to self-policy,” thereby stringier the EG and distribution in Niger State (EO II and III).

Nigerian policies have been consistently inconsistent. Each government wants to adopt its political agenda without reflection on the economic Wellbeing of the target beneficiaries. This philosophy is antithetic to policy sustainability and has affected the citizens' confidence in most of the policies introduced by the Nigerian government since independence (Aigbokhan, 2000). Thus, there are the needs to develop best practices of EI with stringent values and transparent governance that will inspire the electricity consumers of the policies to trust governmental activities.

5.5 Strategies to Improve Electricity Infrastructure in Niger State

The problem of epileptic power supply in Nigeria is a persistent demon in the political campaign of Nigerian politicians. In spite of the growing economy, Nigerians have consistently been fed with failed promises of stable electricity that have, over the decades, plunked domestic households into darkness and crippled industrial producers in many ways. Like the preceding governments across the developing nations, fixing the infrastructure problems, particularly electricity, was one of the key promises since the attainment of political independence. All political rhetoric accompanied the promises. Unfortunately, virtually all the governments could not perform magic in fixing the electricity problems. The implication is that there is no difference between administrations and the leaders who have promised Nigerians a constant power supply.

The fifth objective of this study is to identify strategies for improving power supply in Niger State rural areas. The solutions to the institutional challenges would be realized through intensive and consistent measures that have been carefully synthesized from the views and ideas of the informants and related literature. Various interviewees' accounts pointed to different layers of strategies to improve electricity supply. This comprises good governance, encapsulating accountability, policy consistency and stringent enforcement of the rule of law. Other value orientations include attitudinal change, capacity building and thorough supervision by the management.

5.5.1 Good Governance

The solution to human development in any civilized society is good governance anchored on accountability, transparency and the rule of law (Abel, 2011). Infrastructural development is achievable through a system that gives room for debate and shapes and protects citizens' lives as we trigger windows of opportunities in political and socio-economic spheres.

It is envisaged that a holistic EI policy framework that sticks to good governance principles would significantly create sustainable economic, social and political poverty reduction results. (MucuNigeruzi, 2011). Also, to address the infrastructural challenges in the state, the stakeholders and electricity consumers were interviewed and expressed their opinions on how best to overcome the challenges of the phenomenon.

Comprises of good governance which encapsulates accountability, policy consistency and stringent enforcement of the rule of law. Other value orientations include attitudinal change, capacity building and thorough supervision by the management.

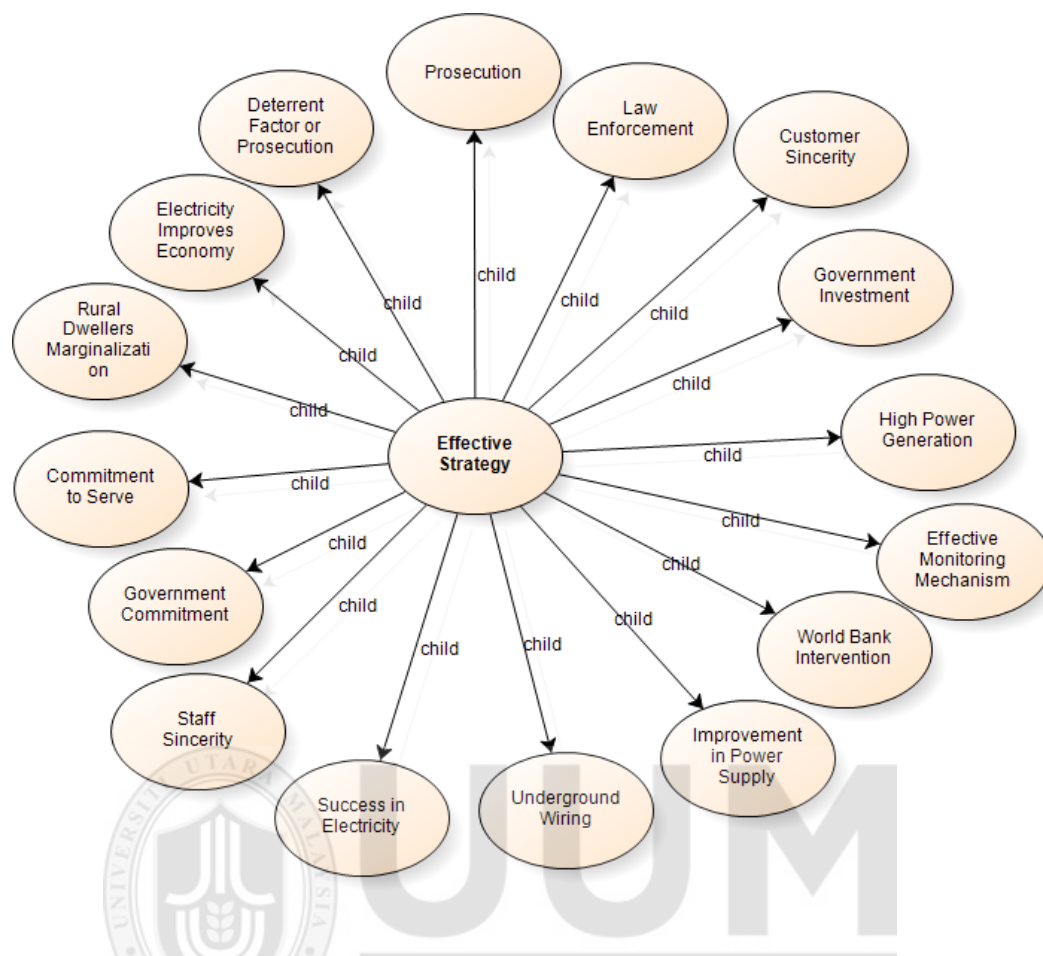


Figure 5.4
Effective and practical Strategies to Overcome Electricity Challenges

In the word of the informant, one of the effective strategies to overcome the Challenges of electricity in Niger is the government's commitment to serving the citizens sincerely. (Talk Niger about good governance). As I said earlier, we are not there yet because we have a target, and to be sincere with you, a lot of people are still looking forward to having more power and more electricity, and we are moving towards that as it is now, we still have some future challenges to enable us to get to that level we are aiming to achieve.” EO 3.

This finding is in line with the position of Abel (2011). He believed that the solution to human development in any civilized society is good governance anchored on accountability, transparency, and the rule of law. Infrastructural development is achievable through a system that gives room for debate and shapes and protects the lives of citizens as we trigger windows of opportunities in political and socio-economic spheres.

5.5.2 Policy Consistency

Poor electricity is strongly consistent with social problems like starvation, illiteracy, and crime, and it hampers the development efforts of a given country. To mitigate the socio-economic discontent of the poor citizen and the sorry state of Nigeria and Niger State, successive governments, both military and civilians, respond to electricity problems with various policies. The efficacies of the policies have been questioned by different scholars (Aminu & Onimisi, 2014). To solve electricity problems, the following strategies were suggested by the interviewees.

The government should be consistent in its policies. Change of government should not be a barrier to the existing policy or program. Instead, the government should be firm and maintain the status so long it will bring meaningful change (HH II).

In a similar narration, another informant advocated for “...government consistency in its policy and to also embark on project or provision of services that will outlast their tenure”. It was further suggested that

...government should be sincere in its policy and be committed to RD through effective policy implementation. This can only be achieved if policies and programs are made

relevant to the rural people through active participation in the determination of their felt- needs with a view to bridging the gap between the intent and the actual application of policy
(EO III)

In line with the above, a study reveals that infrastructure challenges have aggravated due to multiple policies, policy inadequacies and inconsistencies (Aminu & Onimisi, 2014). Consequently, several programs were adopted to correct policy distortions and imbalances, yet it further deteriorates the situation among the vulnerable groups in Nigeria. The weaknesses in the prevailing policy framework and the intensity of the scourge call for government consistency and transparency in its policies and programs to give room for the electricity stability agenda as well as to accord citizens self-confidence, support and trust for the government, generation of new ideas, citizen empowerment among others.

5.5.3 Accountability

Accountability of public and private officials remains one of the major factors responsible for the rising trend of infrastructural challenges in developing nations (Sarker & Rahman, 2015). Top on the list of electricity challenges in Nigeria is poor accountability, transparency, and lack of political will to fight against the ills of poor governance and many more (MucuNigeruzi, 2011).

Infrastructural development is determined by good governance, while good governance is characterized by accountability, transparency, openness, contestability, a high degree of inclusiveness, and promptness. Based on this notion, the informant “I

called on Niger State government “... to address bureaucratic bottlenecks by promptly attention to electricity problems... and political office holders should be accountable to the electorates on their achievements from time to time...” Reiterating the above argument, another interviewee acknowledged that:

...on the list of the challenges that affect electricity supply in Niger state are corruption, lack of transparency, ineffective service delivery systems, lack of political determination to combat the ills of poor governance and above all, poor accountability (HH I).

In view of the preceding analysis, we can deduce that accountability is a significant solution to electricity problems as it ensures checks and balances among policymakers and consumers. It accelerates performance appraisal of the system and serves as a guide and a benchmark to measure the success or failure of electricity supply and RD.

5.5.4 Rule of Law

United Nations defines the rule of law as a principle of governance where individuals, organizations, private or public, and the state are accountable to laws publicly proclaimed, enforced, and independently arbitrated in line with international human rights standards. Article 11, section 1 of the International Covenant on Economic, Social and Cultural Rights (ICESCR) provides that states parties to the treaty shall appreciate the right of every individual to have a sufficient standard of living for himself and his family, for which EI is one.

According to one of the stakeholders:

Application of the rule of law in the execution of policies and programs, as well as accountability among us who are given the mandate to implement these policies, will assist enormously in addressing electricity challenges in the rural areas of Niger. This is based on the fact that criminals have little or no chance of getting away with their crimes, as any breach of the law can cause them a prison sentence or fine or both (STKHD II).

Stressing the significance of the rule of law on electricity stability, an informant opined that a country would take off the shoes of continual darkness if the concept of the rule of law is stringently observed.

One of the strategies for infrastructural development (electricity) in civilized societies or nations is good governance anchored on the rule of law. It is about a system that protects and persecutes people with little or no consideration for status, a system that gives room for debate and shapes citizens' lives. (EO III).

In view of the above, Ibrahim (2007) suggests that African and particularly Nigerian leaders require a Stronger democratic society premised on the applicable rule of law to effectively combat infrastructural challenges. In addition, judicial institutions should be strengthened to lead a crusade on restoring the virtues of honesty and the rule of law, ensuring hard work, selfless service, moral uprightness, and patriotism based on improved living standards.

Electricity problems will be reduced if the government exhibits a high commitment to implementing its programs as enshrined by the law. By implication, the rules establishing the programs should be strictly observed, and all acts of violations should be summarily sanctioned (EO II).

The preceding submissions demonstrate that a sound and incorruptible legal institution that plays the game according to the rule is a sine qua non to electricity challenge. A

legal system that directs and compels the leaders to do the needful and empowers the citizens with the platform to express their grievances against political leaders and public officials and hold them to account for corrupt practices has optimism about improving the electricity problem in Niger.

5.5.5 Value Orientation

Value orientation signifies the principle of correct and incorrect or right and Wrong that an individual or social group anticipates. A value system relates to complex beliefs about what is preferred or significant. It is characterized by core intellects guiding human behavior and influencing life choices through a decision-making framework. Values orientation as a concept is perceived as an attempt to map out guiding principles that manifest within the domains of human dealing (Butz, 1997).

Management of an institution in Nigeria has multi-ethnic implications due to individual sentiment to value systems, cultural diversity, and religious differences. Therefore, to address our national problems like EI, there is a passionate need to resolve individual personality with official responsibilities and adopt a universal orientation in our organizations, irrespective of ethnic or religious differences. This will address barriers to the effective implementation of policies and programs (NEEDS, 2004).

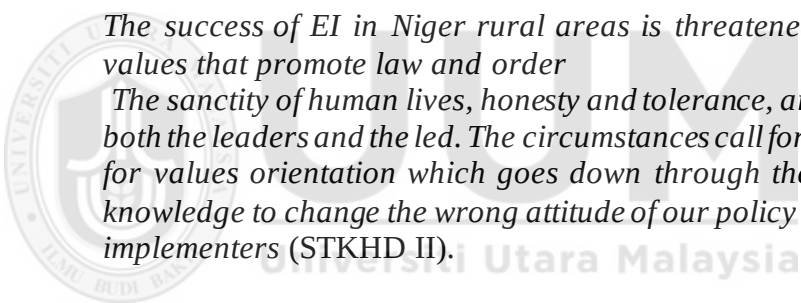
Expressing their opinions on the strategy to improve EI in Niger rural areas, stakeholders and electricity consumers made some important suggestions that focus

on the orientation of the citizens and good value qualities, which can be achieved through attitudinal change and discipline to check deviants in the society.

5.5.6 Attitudinal Change

The attitudinal change represents a precise form of self-modification, self-control and social control that does not need surveillance, sanction, or coercion. It is the individual broad-spectrum evaluative perception of a stimulus or set of stimuli (Petty & Cacioppo, 2012).

Expressing optimism on EI in Niger State rural areas, Stakeholders aver that:



*The success of EI in Niger rural areas is threatened because; core values that promote law and order
The sanctity of human lives, honesty and tolerance, are disoriented by both the leaders and the led. The circumstances call for the urgent need for values orientation which goes down through the inculcation of knowledge to change the wrong attitude of our policy formulators and implementers (STKHD II).*

Barely all the informants linked the bane of electricity problems to poor leadership commitment. Thus, they expressed optimism that attitudinal change will minimize sabotage of the government's effort on electricity and consequently propel economic development through stable power supply to the rural populace in Niger and Nigeria as a whole. Substantiating their views on the function of leadership towards societal change, Gordon Brown declared that significant change is attained and sustained when committed leaders stimulate others to follow when they determinedly stand up for justice to preserve their personal and national integrity and pass it along person-to-person to establish a crusade that others will embrace (Straw, 2009).

Reminding the citizens of the roadmap to a new Nigeria, the president of the Federal Republic of Nigeria echoed during the independence broadcast that:

*“Change does not just occur. We must all appreciate our individual roles to play if we want to bring new changes. We must change our unruly habits, **our attitude to public office and public trust**. We must change our disruptive behavior in schools, workplaces, marketplaces, motor parks, roads, homes, and offices. To bring r about Change, we must change and check ourselves by religiously Being law-abiding citizens”* (Buhari, 2015).

Bearing in mind the implication or importance of attitudinal change, a stakeholder recounted that during the period under evaluation, the government engaged the services of its personnel and the media houses to educate the citizens, most especially the electricity consumers, from time to time. Accordingly, he stated that:

In this political dispensation, the government creates room for awareness about political issues, changes our people's attitude toward paying their bills, and embraces all government policies. Therefore, we utilize the services of media houses, National Orientation Agency (NOA) and Desk officers to sensitize the people to embrace and support government programs and policy and to shun the common belief that “what belongs to everybody belongs to nobody” instead, they should consider it as “what belongs to everybody belong to all” (STKHD III).

Similarly, one of the Electricity Officials perceived “.... hard work, perseverance and change of attitudes are key to stable electricity supply....” Furtherance to the above, he asserted that:

...Change of attitude in this context entails a swift shift from traditionalism to modernity. ...let us be a change agent and focus on the development of the downtrodden as they constitute the backbone of this great state and Nigeria at large. (EO III).

Attitudinal change is all encircling advancing public institutions, national policies and programs. It shapes the mind of the people where every citizen is cognizant of the right thing to do and the collective consequences of doing the wrong things. In line with the above, we are inclined to believe that when our thinking and attitudes towards EI change from negativism to positivism, power supply in the rural areas of the state and Nigeria will improve significantly. Therefore, re-orientation of the minds of the leaders and the followers is a prerequisite to electricity stability in Niger and Nigeria at large.

Finally, to “solve the electricity problem in Nigeria, it is important to approach it from a multidimensional perspective. The federal government must understand the gravity of the power crisis and how harmful it is to the rural areas in Nigeria and the West African economy. The issues must be seen as the number one priority because everything runs on electricity in the modern world, and having zero Mw per capita means having zero interest in foreign investment and operating a slow domestic economy. Therefore, governments at all levels, federal, state and local governments, must join hands in carrying out a multi-faceted plan that will rectify the situation in less than a decade. Government policy must resolve the prospect of scavenger industries sabotaging the progress of electricity. These industries make a living from the corruption and dysfunction of the system. For instance, someone engaged in pipeline bunkering will not want to see national pipelines protected,

Someone that makes a living Importing electric generators may not want to see the country enjoying an uninterrupted” power supply.

5.6 Summary of the Chapter

This chapter further provided corresponding proof to the findings from the result of administered questionnaires or responses of 444 respondents. The interview had stakeholders and beneficiaries as informants whose views formed the platform for this analysis. The thematic analysis through QSR Nvivo 10 software turned out to themes, sub-themes, and vi-a-vis sub-sub themes. So, through the perceptions of the Informants, particularly the stakeholders, the study reveals that EI has impacted rural development, among others.



CHAPTER SIX

CONCLUSION AND RECOMMENDATION

6.1 Introduction

The main objective of this chapter is to discuss the outcome of this study in accordance with the research questions, hypotheses, and literature review. Therefore, the chapter is structured into six sections. Firstly, the section highlights the review of the research findings of the study, and the second section delves into the discussion of the study findings in relation to the hypotheses tested. Also, both the third and fourth sections deal with the discussions, findings, and suggestions for further research, respectively. Then, the fifth section presents this research limitation for the study, and the last section succinctly discusses the study's conclusion.

6.2 Review of the Research Findings

Basically, this study assesses the impact of EI on the development of rural areas in the State. Therefore, the objectives of this study are as follows,

- a) to determine the relationship between EI as well RD in State.
- b) It assesses the moderating effects of political will on EI and RD in the area.
- c) To examine the role of good governance as an intervening variable in mediating the relationship between EI and RD in Niger State.
- d) To identify the challenges of electricity distribution in the rural areas of the state,
- e) to explore the strategies that would help to improve the electricity supply in the rural areas of Niger State.

However, it is obviously clear that this study was primarily conducted to provide answers to the research questions as stated accordingly:

- a) To what extent has EI influenced RD in Niger State?
- b) Does political will moderate the relationship between EI and RD in rural areas?
- c) Does good governance mediate the relationship between EI and RD state?
- d) What are the challenges of electricity in the state's rural areas?
- e) What are the strategies required to improve electricity in the rural areas of Niger State?

As discussed in the fourth chapter of this study, data used for analysis was collected from rural dwellers and electricity consumers spread across the twelve local government areas selected from the three senatorial districts of Niger State of Nigeria. For straightforward generalization of the research findings, 444 questionnaires were distributed to the selected rural dwellers from the twelve local government areas selected from the three senatorial districts of Niger State of Nigeria. A total of 399 questionnaires were returned and became useful and removed to avoid ambiguity in the responses. Hence, 395 responses represent the total number of usable returned questionnaires for further analysis, resulting in a response rate of 89% for this study.

To this end, the data analysis was carried out and hypothesized the relationships that were proposed and tested in the structural model using SmartPLS version 3.2.7. Thus, the available options of significance levels for the researchers are 0.10, 0.05, and 0.01 were adopted critically to decide whether to agree or reject the hypotheses. In respect of the criterion, the outcomes of the analyses found that five that were hypothesized had direct relationships and were statistically accepted in this study. Also, one out of the three hypothesized moderating effects and one out of the three hypothesized mediating effects was also statistically significant and accepted.

The findings of the PLS path modelling indicate that electricity transmission (ET) had a significant positive relationship with RD (RD). The PLS path analysis further reveals that both electricity distribution (ED) and EG (EG) have a significant positive relationship with good governance (GG). More so, the PLS path analysis shows that both good governance (GG) and political will (PW) have a significant positive relationship with RD (RD). While Political will (PW) moderates the relationship between electricity transmission (ET) and RD (RD), good governance (GG) mediates the relationship between electricity distribution (ED) and RD (RD).

Based on the face-to-face interview, chapter five analyzed qualitative data using content analysis. The coding captures the effects of electricity infrastructure on RD in Niger State. It represents the first theme of the qualitative data and answers research question 4 with 2 subtopics. Challenges of EI are the second theme, and it responded to research question 5 with sub-themes. The last theme is the strategies recommended by the informants to address the challenges of electricity in the rural areas of Niger State.

6.3 Discussion of the major Findings

This section presents a comprehensive finding of this study based on the research questions, research objectives, research framework, hypothesized relationships and interviews conducted with nine (9) informants.

To proffer a solution to the critical research questions put forward by this empirical study, EI was discovered to significantly influence the development in the rural areas of Niger State. This was made possible by the result of the analysis, which revealed that electricity transmission has a significant impact on RD. Electricity distribution was found to have a significant influence on RD through the mediating effect of good governance. Both electricity distribution and EG have a positive influence on RD.

Moreover, good governance and political will were found to significantly influence rural areas' development in the state. Notably, in the results, five out of the eight hypothesized direct relationships of this study were statistically significant and supported. More so, out of the three hypothesized moderating relationships, only one was statistically significant and supported. Similarly, one of the three hypothesized mediating effects is statistically significant and supported by this study. Therefore, with the moderating and mediating effects of good governance and political will, the influence of electricity on rural areas of the entire state is significant.

6.3.1 Influence of EI on RD in Niger State

Statistically, this study has established positive relationships inconsistent with the three direct hypothesized relationships. This study has found the existence of a positive as well as serious relationship between electricity transmission and RD. This result was found to be consistent with that of the hypothesized relationship proposed by this study and prior studies such as Aghoin et al.(2013), Du and Temouri (2015), Kenfack et al. (2014), and Moyo (2013), all of whom established that the quality and quantity of infrastructure have a significant effect on the achievement of high production, income generation as well as job opportunities. Further confirmation of the literature portends that rural electrification would alleviate poverty, amend development imbalance and improve the general well-being of the citizens (Marshall et al., 2016; Twine et al., 2016).

Conversely, this study also found that EG is positively related to RD but not statistically significant. Though EG is vital as an element of EI that can positively affect RD, it's statistically insignificant may be due to the inability of the EG firm to generate the required amount of electricity to serve the entire rural communities. To buttress this, Egboh (2011) lamented the inability of the country to generate enough electricity for the over 180 million people despite the country's endowment with abundant solar, wind, hydro, thermal energy and bioenergy, only 4000 MW which is grossly inadequate for such population could be generated. Hence, this hinders the level of development in these rural settlements due to the unbalanced accessibility of rural communities to the electricity service in Nigeria as a result of inefficiencies

overriding the allocation of electricity resources coupled with the depletion of fossil fuels (Shaaban & Petinrin, 2014), thus causing low level or in some cases lack of economic activities that could facilitate development in such areas.

Similarly, with inadequate electricity generation, electricity distribution would be difficult as providing electricity to the right place at the right time becomes an issue. This study revealed a significant relationship between electricity distribution and RD, but there is no statistically significant relationship between them. This was a result of the poor state of electricity distribution, which adversely affected the welfare and security of as well as the properties of the people (Olatomiwa et al., 2015). As evidence, about 2% of rural people in Nigeria have access to electricity, which was facilitated through rural electrification initiatives or self-generated electricity by private individuals (Chineke & Ezike, 2012; Mohammed et al., 2013). Hence, this study portends that EI, which could have positively affected RD and delivered healthier living conditions, health facilities and delivery services, as well as several services to the rural populace, can still be achieved through good governance and political will of the leaders.

6.3.2 Moderating Effect of Political-will on the relationship between EG, Electricity Transmission, Electricity Distribution and Rural Areas Development in Niger State

The finding from this study reveals that only one out of the three moderating hypotheses has been conceptualized in the models was statistically significant and accepted. Notably, political will significantly and positively moderate the relationships

between electricity transmission and RD, as it was structurally hypothesized in the models of the study. Furthermore, the graphical analysis indicates that leaders 'political will Strengthen the positive effect of electricity transmission on RD and, alternately, weakens the relationship of the low political will.

However, the moderating effects of political will on the relationships between electricity distribution and RD and between electricity generation as well as RD were not significant statistically and thus not supported. This indicates that whether the political leaders have the strong or weak political will, there is no significant effect on the influence while testing the relationship in-between electricity distribution, EG, and development of rural areas in Niger State of Nigeria.

6.3.3 Mediating Effect of Good Governance on the Relationship between Electricity Generation, Electricity Transmission, Electricity Distribution and Rural Areas Development of Niger State

The finding from this study reveals that only one of the three mediating hypotheses, as conceptualized in the model, was statistically significant and accepted. Observably, good governance positively and significantly mediates the relationships between electricity distribution and RD, as it was structurally hypothesized in the model of the study.

Conversely, the mediating effect of good governance on the relationships between EG and RD, as well as electricity transmission and RD, were both positive but not statistically significant, as indicated from the finding of this study. This finding may

be a result of the political instability experienced by the country over the last decade, which also led to a lack of investment in EG and transmission infrastructure. Being an elephant project that requires heavy expenditure and time to put in place, the good governance exhibited by the present government seems to have a little positive impact which will not immediately have noticeable effects on RD.

6.3.4 Challenges of EI in Niger State

In this study, institutional challenges are the major stumbling block to EI in the state's rural areas. The institutional refers to the structural or the organizational problems like unceasing sabotage and vandalism among the personnel and specifically the stakeholder, fiscal challenges, misappropriation of funds, political intervention in the execution of electricity policies, inconsistent electricity policies, absence of political will and insincerity among the leadership in policy implementation. Others include the poor operational capacity of the power generation, transmission and distribution companies, poor implementation of policies and programs, scarcity of gas supply, transmission and distribution etc.

6.4 Practical contribution

The value of any study that serves as an intellectual merit to the researcher is its ability to apply its findings to societal problems. With the universal quest to address infrastructural (electricity) challenge, the study will empirically serve as an essential instrument to policymakers in the electricity sectors, practitioners, and analysts, as well

as remodel the skills of researchers in public policy and their understanding of EI concept along with the procedure of evaluation.

In addition to the advancement of academics and knowledge in the public policy domain, this study also has practical implications on the identified challenges of EI and strategies to facilitate its improvement in the rural areas of Niger state. This will be useful to the government authorities and companies that handle electricity affairs in the State. Thus, it will offer opportunities to improve policies and generate the political will to invest in the monitoring and evaluating activities of the government, most especially EI in Niger and beyond.

6.5 Theoretical Contribution

The study further re-confirmed the roles of adapted theory (system theory) to examine the relationship between EI and RD. The theoretical contributions were generated from the research findings and discussions by providing supplementary and empirical evidence from the domain of the system theory. The study provides value-addition to the theoretical explanation by establishing a moderating effect of political will and mediating effects of good governance with RD, respectively.

This study has provided a theoretical implication because it has proved the philosophical assumptions of System Theory by explaining the relationship between the causes and effects of EI and also clarifies how the initiation of moderator and mediator (political will and good governance) will contribute to the attainment of RD.

Through the research questions, the theory discusses variables concerning electricity delivery mechanisms and illuminates why electricity has or has not been delivered accurately. Premised on the above, this study has complemented and advanced the spirit of evaluators and program managers to comprehend why EI was delivered or failed as pre-determined in the annual budget.

6.6 Methodological Contribution

The disagreement of using one data collection method encouraged this study to bridge the methodological gap by adopting both quantitative and qualitative methods to analyze the data generated from various sources. The application of mixed methods in this study enables the researcher to strike a balance by maintaining complementary strengths, which placed the study to implement the assumptions of each technique and consider the methodologies as independent of each other. The methods were individually detached and later embedded at the discussion level making the findings of the study entirely and thoroughly grip the entire cycle of EI and RD and disallowed what would have been ignored or disregarded if only a qualitative method or quantitative method was used independently. In line with methodological contribution, De lisle (2011) upheld that a ‘qualitatively driven’ method to mixed methods proffers immense prospects for breeding new methods of understanding the difficulties in the contexts of social experience.

The likeness of this study in the past employed the use of investigative tools like SPSS, simple regression analysis, and descriptive statistics to generate results. In relation to

the methodological gaps, this study explores a new tool of analysis (i.e., PLS) to explain the structural relationship of the variables. PLS path modeling is used to examine the items of all the constructs in terms of convergent validity and discriminant validity, respectively. This demonstrates the significance and power of PLS-SEM application to modeling and circulating modern public administration research.

6.7 Limitations and Guides for Future Study

There are rare studies that are absolutely considered perfect or flawless. This study on the impact of electricity infrastructure on RD is not exceptional. Appraisal of government activities is considered in Nigeria and certainly universally a sensitive issue, particularly if such government does not meet up with its constitutional responsibilities (Macugunzi, 2011). This made the respondents and informants, mainly the stakeholders, electricity personnel, and interviewees, very nervous, aggressive and skeptical in providing pertinent information due to the prevailing political situation in Niger state, despite our guarantee of confidentiality. This explains why the questionnaire recorded some instances of neutral responses.

The inaccessible nature of the rural area where the study covers, along with the poor road network and respondents' commitment to Farming and business activities, posed a serious challenge in the course of data collection as they had little or no time to attend to the researcher. Also, majority of the respondents blatantly demand gratification as a pre-condition to complete the questionnaire or grant an audience for an interview. In light of the foregoing, future researchers should sensitize the respondents to the

importance of their studies. In addition, data collection on the like of this study should be after seasonal harvest to sway the concentration of the respondents/informants.

As a case study, this research work is confined to a few local governments in Niger State, and the researcher cannot rule out different views from the remaining local governments of the state (Simon & Goes, 2013) because case studies involve the behavior of different persons and groups that may not necessarily replicate the behavior of other persons or considered for generalization of the study. Therefore, conducting a similar study in other local governments would support a better generalization of the findings.

The sample size for the present study was 444, out of which 399 was the response return rate. Hence, with the erasure of multivariate, the final dataset stands at 395. This sample represents a small percentage of the whole population of the study area. As a result, studies with a larger sample size would be essential to enhance the complete evaluation of EI's impact on RD and generate a broad view of the respondents/informants.

Despite the numerous contributions of this study, all the factors contributed to rural development generated 47% on good governance and 35% on rural development. This indicated that other factors could contribute to the rural development and good governance in Nigeria, such as good roads, education and internet services. This study suggests that future researchers consider other factors not highlighted in this study.

6.8 Conclusion

The basic argument of this study is to examine the impact of EI on RD and the role of political will and good governance, respectively. The findings established that electricity transmission (ET) has a significant positive relationship with RD (RD). The PLS path analysis further shows that both electricity distribution (ED) and EG (EG) have a significant positive relationship with good governance (GG). More so, the PLS path analysis shows that both good governance (GG) and political will (PW) have a significant positive relationship with RD (RD). While Political will (PW) moderates the relationship between electricity transmission (ET) and RD (RD), good governance (GG) mediates the relationship between electricity distribution (ED) and RD (RD).

Revealing the level of significance of the quantitative findings, the qualitative findings indicate that electrical infrastructure has a marginal impact on the social and economic lives of the rural dwellers in the State. By implication, electricity provides assistance in the form of palliative measures for a short period of time, as the government fails to provide a lasting solution to its result of corruption, horrible looting, challenges of continuity or self-succession, political deception and many more.

6.9 Policy Recommendation

Finally, to solve the electricity problem in the State, it is important to approach it from a multidimensional way. The federal and Niger State government must understand the gravity of the power crisis and how harmful it is to the rural areas in Nigeria and the West African economy in today's world. The issues must be seen as the priority because, in the modern world, major infrastructures are electronic and electrically

driven. To have zero MW per capita simply means having zero interest in foreign investment and operating a dead domestic economy. Therefore, governments at all levels, federal, state and local governments, must join hands in carrying out a multi-faceted plan that will rectify the situation in less than a decade. Government policy must resolve the prospect of scavenger industries sabotaging the progress of electricity. These industries make a living from the corruption and dysfunction of the system. For instance, someone engaged in pipeline bunkering will not want to see national pipelines protected, and someone that makes a living from Importing electric generators may not want to see the country enjoying an uninterrupted power supply.

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The systemic failure breeds an incidence of impunity which wreck government policies and programs in Niger. The deliberate disrespect of institutional law and unlawful liberty or arrogance of power among the stakeholders, coupled with continuous evasion of justice, explains the continual power failure in the rural areas of the State. The consequence of impunity led to emerging discrepancies and uneven power distribution between the urban and the rural areas. This questioned the integrity of leadership and the practice of good governance in Niger. It, therefore, calls for the immediate need for structural transformation, which becomes crucial for implementing the law that will govern the judicial system, also, the general welfare of the electricity personnel vis-a-vis to ensure and maintain the existence of the rule of law as a panacea to the economic prosperity in the state rural areas.

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Appendix A

Krejcie and Morgan schedule table

Table 3.1

Table for Determining Sample Size of a Known Population

N	S	N	S	N	S	N	S	N	S
10	10	100	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	265	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Note: N is Population Size; S is Sample Size *Source: Krejcie & Morgan, 1970*

Appendix B

Research Questionnaire

GhazaliShafie Graduate School of Government,
College of Law, Government and International,
Studies,
Universiti Utara Malaysia,
Sintok, Kedah Darul-Aman,
Email: gsgs@uum.edu.my
Tel: (+604) 928 7751 Fax: (+604) 928 7799
Date.....2017

Dear respondents,

ACADEMIC RESEARCH QUESTIONNAIRE

I am a doctoral student of the above institution presently conducting a study on
“**Electricity Infrastructure and Rural Development: A Study of Niger State,
Nigeria from 1999 to 2015.**”

I would be please if you could make use of your valued time to fill in this questionnaire.
Accurate and complete information provided would give us a guide and facilitate the
study; therefore, you are requested to be objective in your responses.

Finally, be assured that your responses would **ONLY** be use for academic purposes
and would also be strictly kept confidential.

Thank you in an anticipation of your responses.

Yours Sincerely,

Ahmed Shehu

Research Student

Section 1

A. Demography and Socio-economic characteristics

Instruction:

Kindly read and tick the most appropriate box in the following demographic and socio-economic information:

i. Gender

Male	1	Female	2
☐	☐	☐	☐

ii. Age

15-25	26-35	36-45	46-55	56 & above
1	2	3	4	5

iii. Marital status

Single	Married	Divorce	Widow
1	2	3	4

iv. Occupation

Civil servant	Farming	Business
1	2	3

v. Qualification

Adult Education/Qur'an	Primary Certificate	SSCE	Diploma	BSc/HND
1	2	3	4	5

vi. Income

Income earned before the installation of electricity	Grade	Income earning after the installation of electricity	Grade
Below 20,000	1	Below 20,000	1
20,000 – 50,000	2	20,000 – 50,000	2
51,000 – 100,000	3	51,000 – 100,000	3
101,000 – 150,000	4	101,000 – 150,000	4
151 and above	5	151 and above	5

Section 2

Electricity and Infrastructure (Electricity generation, transmission and distribution)

Instruction:

The following questions will help us know about electricity infrastructure (generation transmission and distribution) in your community. You are not subjected to examination or test. Therefore, there are no correct or incorrect answers to any question. Yet, the success of this survey highly depends on your answers to all questions. Please be honest and objective on the extent to which you have benefitted

from the infrastructure. Use the scales provided below to show your level of agreement or disagreement with each statement.

Strongly disagree -1, disagree - 2, neutral - 3, agree- 4 and strongly agree – 5

S/N	Statement	Grade				
1	My community is connected to electricity	1	2	3	4	5
2	There is regular electricity in my community	1	2	3	4	5
3	There is high power voltage in my community	1	2	3	4	5
4	I am self-employed as a result of the connection of our village to electricity.	1	2	3	4	5
5	Electricity distribution staff attend to us when there is problems	1	2	3	4	5
6	There is periodic electricity service in my village	1	2	3	4	5
7	Electricity is used in farming activity	1	2	3	4	5
8	My farm product has improved as a result of electricity installation	1	2	3	4	5
9	We can preserve our farm products with electricity	1	2	3	4	5
10	Rural clinic/dispensary has benefitted from electricity	1	2	3	4	5
11	There is no electricity rationing in my community	1	2	3	4	5
12	I get electricity supply from the government/institution (system theory)	1	2	3	4	5

Section 3

Political Will

Note: Political Will in this study refers to the commitment, promises, obligations and the ability of political office holder representing your constituency in the government to strengthen their set objectives and to implement it accordingly.

Instruction:

The following questions will help us know how political-will strengthen stable power supply in your community. Please be honest and objective on the extent to which you have benefitted from the infrastructure. Use the scales provided below to show your level of agreement or disagreement with each statement.

Strongly disagree -1, disagree - 2, neutral - 3, agree- 4 and strongly agree – 5

S/N	Statement	Grade				
1	Our community has political representative	1	2	3	4	5
2	Government set agenda for community development	1	2	3	4	5
3	Activities of political leaders are transparent (Known to the citizens)	1	2	3	4	5
4	Our community was promised to be connected to electricity during campaign.	1	2	3	4	5
5	Our community was connected to electricity after the election	1	2	3	4	5
6	Our political representative help us to solve our community problems (e,g electricity).	1	2	3	4	5

Section 4

Rural Development (Income, health, social services and living condition)

Instruction:

The following questions will help us know about how electricity infrastructure contributed to the development of your community in the area of income, health, social services and improved living condition. Please be honest and objective on the extent to which you have benefitted from the infrastructure. Use the scales provided below to show your level of agreement or disagreement with each statement.

Strongly disagree -1, disagree - 2, neutral - 3, agree- 4 and strongly agree – 5

S/N	Statement	Grade				
1	Electricity has improved my income as result of petty trade on drinks (mineral, cold water etc)	1	2	3	4	5
2	News from radio and television provide good information relevant for conducting business	1	2	3	4	5
3	The use of electricity has allowed me to keep my business open for longer hours	1	2	3	4	5

4	The cost of electricity is quite reasonable for my business	1	2	3	4	5
5	With electricity, our living condition has improved	1	2	3	4	5
6	Our household is happy with the lighting system that we have in our home	1	2	3	4	5
7	Electricity has minimized our visit to urban clinic as basic services are provided in the rural areas	1	2	3	4	5
8	With the use of fan, sickness like malaria has reduce drastically in my family	1	2	3	4	5
9	Poor electricity service has affect our business	1	2	3	4	5
10	With electrical light the children can study at night	1	2	3	4	5
11	I feel safe from reptile in my house at night	1	2	3	4	5
12	The electricity makes it easy to have information and the news.	1	2	3	4	5
13	Watching TV provides my household with great entertainment	1	2	3	4	5



APPENDIX C

INTERVIEW GUIDE FOR STAKEHOLDERS OF ELECTRICITY INFRASTRUCTURE AND REPRESENTATIVES OF THE RURAL COMMUNITIES

- iii. In your perception, what are the major successes of electricity infrastructure in the rural areas of Niger during the period under review (1999 to 2015)?
- iv. Regardless of collective grades of political will among the political stakeholders, how do you assess the government commitment towards electricity infrastructure in Niger State?
- v. In your personal opinion, how do you evaluate electricity generation, transmission and distribution in the rural areas of Niger state?
- vi. What are the major challenges confronting electricity infrastructure in the rural areas of Niger State?
- vii. What are strategies to overcome electricity challenges in the rural areas of Niger state?