University of Kent | School of Social Policy, Sociology and Social Research

ENVIRONMENTAL POLICYMAKING AND IMPLEMENTATION IN NIGERIA: THE CASE OF CLIMATE CHANGE MITIGATION

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Abstract

Climate change demands a reduction in greenhouse gas emissions and the implementation of climate change mitigation policies is crucial in meeting this goal. However, the implementation of climate change mitigation policies has been a challenge in many parts of the world, due to political, institutional, social, economic, and cultural factors. Although, the institutional barriers to environmental policy implementation are well documented, the socio-economic constraints, from the resource-poor perspective in low in-come countries like Nigeria, have received little discussion. This study draws on theories of policy implementation processes, such as the Contextual Interaction Theory, and views from the literature on environmental management and resistance to policy change to develop an original framework through which the socio-economic factors that shape environmental policy implementation in the context of resource-poor people can be explained.

Using a mixed research method, with mostly a qualitative approach, which involved 57 Semi-structured Interviews, 42 Qualitative Survey Questionnaires and Participants Observation, with policymakers, academics, and civil society activists, I explore how the implementation of low-carbon energy and forest management policies is unfolding in Nigeria between 2010 and 2021 and the implication on its 2030 targets. This thesis contributes to the environmental management and policy implementation literature by showing how the implementation of climate change policies confronts social and economic challenges in the contexts of developing countries. The study identifies resources, social safeguards and stakeholders' involvement in policy design and decision-making processes as key factors that promote motivation and feasibility for the sustained adoption of renewable energy, energy efficient, and forest conservation practices amongst the resource-poor population. However, where these factors are lacking, resistance may occur. Thus, this study suggests that a more holistic and strategic approach to environmental management that speaks to Nigeria's socio-economic contexts should be employed in the design and implementation of climate change mitigation policies. Adopting this approach could result in pro-environmental behaviour and the motivation and support for sustained adoption of renewable energy and energy-efficient and conservation practices.

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List of Acronyms

AfDB	African Development Bank
AFOLU	Agriculture, forestry, and other land-use
AGO	Automobile Gas Oil
ATF	Anti-Deforestation Task Force
BAU	Business as usual
BRT	Bus Rapid Transit
CBR+	Community Based REDD+
CIT	Contextual Interaction Theory
CISME	Centre for Investment, Sustainable Development, Management, and Environment
CRS	Cross River State
CRSFC	Cross River State Forestry Commission
CSO	Civil Society Organisation
DCC	Department of Climate Change
DFID	Department for International Development
FAO	Food and Agriculture Organisation
FCPF	Forest Carbon Partnership Facility
FDF	Federal Department of Forestry
FMC	Forest Management Committees
FMENV	Federal Ministry of Environment
GEF	Global Environment Facility
GGCA	Global Gender and Climate Alliance
GHG	Greenhouse Gas
HHK	Household Kerosene
IEA	International Energy Agency
IMF	International Monetary Fund
IPCC	Intergovernmental Panel on Climate Change
IRENA	International Renewable Energy Agency
LED	Light Emitting Diode
LGA	Local Government Area
LPG	Liquified Petroleum Gas
NASA	National Aeronautics and Space Administration

NCCPRS	National Climate Change Policy Response and Strategy
NDC	Nationally Determined Contributions
NESP	Nigerian Energy Support Programme
NGO	Non-governmental Organisation
NLNG	Nigeria Liquid Natural Gas
NNPC	Nigerian National Petroleum Cooperation
NREEEP	National Renewable Energy and Energy Efficiency Policy
NSWG	National Safeguards Working Group
NTFP	Non-Timber Forest Products
OECD	Organisation for Economic Co-operation and Development
PHFFG	Portable Household Fossil Fuel Generator
PMS	Premium Motor Spirit
RDDC	Resource-dependent Developing Countries
REA	Rural Electrification Agency
REDD+	Reducing Emissions from Deforestation and Degradation
REMP	Renewable Energy Master Plan
RFO	Residual Fuel Oil
RUWES	Rural Women Energy Security
SDF	State Department of Forestry
SDG	Sustainable Development Goal 7
SE4ALL	Sustainable Energy for All
SSA	Sub-Saharan Africa
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNSD	United Nations Statistics Division
WHO	World Health Organization
WTP	Willingness to Pay

CHAPTER 1

"Climate change will not be simply one of many challenges—it will be the dominant challenge" - World Bank (2010:111).

Introduction

Climate change is an environmental challenge with varied dimensions including political, social, and economic. Undeniably, adequate responses based on context-driven policies, formulated, and implemented to reflect socio-economic factors, and the participation of all stakeholders including the resource-poor population are required to reduce the impacts of climate change on global environment.

Being a global problem, it requires the collaborative efforts of all countries to meet the target of reducing greenhouse gas (GHG) emissions, and limit average global temperature increase preferably below 1.5^{o}C by 2030. In response to the call by the UNFCCC[1] to stabilise GHG concentrations in the atmosphere to a level that prevents dangerous anthropogenic interference with the climate system, mitigating measures are being adopted and implemented globally to tackle climate change. For adopted policies to be effective, it is essential that the world engages in sustainable activities and act collectively to tackle climate change (World Bank, 2010). Taking such steps involves elaborate and critical evaluation of the sectors with most contribution to global emissions.

Two major sectors that call for serious attention are energy and forestry. The combustion of fossil fuels and deforestation from illegal logging, combined with intensive agriculture and economic development activities represent major contributors to rising concentrations of greenhouse gases in the atmosphere. Each of these sectors raise unique sets of opportunities and challenges for mitigation (Long, 2014). For instance, while the inherent opportunities include increased employment and contribution to a reduction in GHG emissions, there are equally important social and economic challenges that mitigation measures present. These challenges apply globally but more prominent in developing countries.

[1] United Nations Framework Convention on Climate Change.

Seeing the urgency to combat climate change in a developing country like Nigeria, with issues of energy pollution and deforestation, already visible impacts of climate change, and history of poor implementation of environmental policies, I set out to understand if policies to combat climate change are being implemented and the constraints upon the implementation of climate change policies. Building on existing literature on environmental management and policy implementation, I was initially convinced that the main challenges of environmental / climate change policy implementation in Nigeria was institutional including weak political will, weak regulations, as well as lack of awareness of environmental issues amongst the masses. These issues were also repeatedly reported in my first round of data collection. However, as this research developed, I learnt that policy implementation was more complex and challenged than the institutional constraints reported in previous literature. Moreover, the understanding of the institutional constraints and the general view that policies are rarely implemented in resource-dependent developing countries (hereafter referred to as RDDCs)[2] like Nigeria seems insufficient. My main intention was not to criticise the gaps in policy implementation, but to understand the key challenges in order to find a way to address the environmental degradation and combat climate change. As such, building on the social and socio-economic themes from the initial data collection and further literature studies on environmental management and policy implementation, it was necessary to conduct a second round of data collection to further understand indepth the social and socio-economic challenges of policy implementation in Nigeria.

The understanding of social and socio-economic factors and how they shape policy implementation in RDDCs like Nigeria was very important because of its social and socio-economic contexts and challenges including issues of poverty, poor access to energy and forest resources, land insecurity, social inequalities, poor engagement of citizens in policymaking and decision-making. This is important because policy implementation must be understood from the context where the policy intervention is applied (Smith, 1973; Bresser, 2004; De Boer & Bressers, 2013). As a result, the understanding of context and the need for adequate responses based on context-driven policies, formulated and implemented to reflect social and socio-

[2] In this thesis, I use the term 'resource-dependent developing countries (RDDCs)' to represent developing countries, enriched with natural resources, which also depend greatly on these resources as a source of livelihood and economic development.

economic factors, and the participation of all stakeholders including the resource-poor population to reduce the impacts of climate change on global environment became more of the focus for this study. This is especially important in regards to: 1) promoting sustained adoption of low-carbon energy, and energy-efficient, as well as forest conservation practices, amongst the resource-poor households, and, 2) meeting climate change commitment to reduce energy-related GHG emissions by 2030. Thus, as this research developed, I gained a better understanding of the policy implementation challenges surrounding climate change policy in RDDCs like Nigeria.

The implementation of climate change mitigation policies is challenging for RDDCs, especially African countries (Mburia, 2015), given their weak economic and technological capacity and the prioritisation of economic growth above other considerations. It is not difficult to understand the urgency for African countries to develop their economies and meet the basic needs of their people. Many scholars (e.g. Davidson et al., 2003; Ludwig et al., 2007; Omilola, 2014) have reported that in the developing countries' context, climate change ranks low on their priority list. This is especially so in rural communities. For instance, 90 per cent of the rural people in SSA live in poverty, with 80 per cent of them highly dependent on agricultural labour for their livelihoods (Cadzilla et al., 2013). It is reported that the level of poverty will further deepen and poorest people in developing countries will be adversely affected, given the deleterious effect of climate change on climate-sensitive sectors such as agriculture and their economies. According to Tadesse (2010), global food prices have drastically increased in recent years, resulting in severe hardship for the poor people around the world, most especially in Africa. This situation will be further exacerbated by climate change as low agricultural yield could lead to another 600 million people being subjected to malnutrition by 2080. These negative impacts will further cause a downturn in the continent's economic growth, social progress, and political stability; and adversely affect the livelihoods of people in the absence of effective measures to reduce the causes and manage the impacts of climate change.

In addition, the prolonged global financial and economic crisis[3] is likely to worsen the region's economic growth (United Nations, 2009 and Arieff et al., 2010). This adds another layer of

[3] Although, it is suggested that African countries did undergo recession in 2009, it is argued that the continent requires high rates of socio-economic growth (Arieff et al., 2010).

difficulties for Africa in attaining its environmental and socio-economic development goals (Davidson et al., 2003; United Nations, 2009; Muller et al., 2014). For instance, regardless of climate change and its challenges, African countries' priorities are on policies and programs to achieve economic growth. However, some of the economy building strategies are often at variance with climate change mitigation objectives (Cosbey, 2009). Conversely, if not well planned and structured, climate change mitigation goals such as low carbon and forest management goals may conflict with well intentioned social development goals to: end poverty and hunger, sustain economic growth, achieve full and productive employment, and ensure access to clean and affordable energy for all by 2030 (Machingura & Lally, 2017). In addition, the social and economic impact of energy and forest measures, extend to individuals who, for economic and livelihood reasons, may be inhibited in accepting or sustaining the adoption of low carbon energy and forest conservation practices.

Other social and socio-economic factors including, low awareness of environmental issues, poor access to adequate information about policy tradeoffs, poor consideration of social safeguards, and poor engagement of target group in the policymaking and implementation processes, also further complicate the implementation of environmental protection policies in developing countries.

While developing countries are making efforts to contribute to the reduction of global greenhouse gas (GHG) emissions, the question is, given their social and socio-economic challenges, as well as historical challenges of implementing environmental policies, to what extent can resource-dependent developing countries implement mitigation policies to meet the global CO_2 emission reduction target? What are the key factors that affect the implementation of mitigation policies in RDDCs and why?

This research aims to provide insight on these questions through a close examination of Nigeria, a RDDC in West Africa. In particular, I investigate the potential socio-economic constraints upon the implementation of low-carbon development, through case studies on Nigeria's low-carbon energy [4] and forest management measures. The socio-economic constraints focus of this study is to explore the interplay of resources and feasibility of climate

[4] The progress of renewable energy measures, prior and after (a period of 7 years starting from 2015) the Paris Agreement.

change mitigation measures, and resistance to implementation of climate change mitigation measures in poor resource-dependent countries. This study draws upon theories of policy implementation processes, such as the Contextual Interaction Theory, and views from environmental resource management, sustainability, and resistance to change literature. It assesses the extent to which a RDDC, like Nigeria, may fully respond to global climate change mitigation target in reducing global CO_2 emissions below 2^{o}C. Ultimately, it provides insights to policy practitioners and institutions to better address the challenges and complexities of environmental policy implementation in RDDCs.

This introductory chapter lays out essential background through 7 sections. Firstly, I discuss the implementation of climate change mitigation policies in the RDDCs' context. This leads us to an overview of the socio-economic challenges of climate change policy implementation in SSA countries, with a particular focus on Nigeria. Following this overview is a discussion on Nigeria's climate change mitigation policy response. Next, I provide a rationale for this research and key research questions. Finally, I provide an outline of this thesis.

Climate Mitigation and Implementation Challenge in RDDC

One proposed solution to tackling climate change and addressing the challenges of development is the 'low-carbon development pathway' (Eleri et al., 2013; Fisher, 2013; Nordensvard, 2017). Low-carbon development was developed by donors as a response to the urgent needs of developing countries to tackle climate change simultaneously with development needs (Nordensvard, 2017). Within the low-carbon development are three policy agendas - adaptation, mitigation and development, with reference to the green economic concept (Farouk, 2012; OECD[5], 2012; Fisher, 2013; Nordensvard, 2017). The focus of this study is on climate change mitigation policy.

Mitigation is considered as a necessary strategy to mitigate GHGs in order to reduce the likelihood of the severest consequences of climate change (Jones et al., 2007 and Ozor et al., 2012). It involves a transition to a carbon-neutral economy by reducing GHG emissions in the atmosphere due to different unsustainable activities (e.g. the burning of fossil fuels for

[5] Organisation for Economic Co-operation and Development.

electricity, heat or transport) or by enhancing the sinks (e.g. oceans, forests and soil that accumulate and store GHG gases) (NASA[6], 2019). Global Environment Facility (2017) gives examples of some mitigation strategies such as: introducing energy efficient technologies fitted to buildings; promoting and utilising renewable energy sources (solar, wind, hydro); energy-efficient use; promoting bus rapid transit (BRT), electric vehicles and biofuels for more sustainable transport in cities; and fostering more sustainable land and forests use. In developing countries, reductions of GHG emissions are likely to be found in the energy, forestry and infrastructure sectors (Fisher, 2013). As earlier mentioned, this study focuses on the energy and forestry sectors.

Whereas climate change mitigation measures are suggested to be the ultimate solution for climate change (Jones et al., 2007; Akerman et al., 2009; Ozor et al., 2012), a low carbon or carbon-neutral economy by 2050 places great economic costs around the world for global economy remains largely dependent on carbon-intense resources for growth (Akerman et al., 2009). Whereas unsustainable activities by industrialised countries have been widely reported as the major cause of the increase in global temperature (e.g. Ludwig et al., 2007; Schneising et al., 2013; IPCC[7], 2014[a]), developing countries' contribution to global GHG emissions are also rapidly increasing (Romani et al., 2012; Yusuf et al., 2012; IEA, 2014).

A large volume of literature suggests that the growth in emissions in developing countries is partly owing to the growing energy demand and unsustainable forest use (e.g. Chandler et al., 2002; Romani et al., 2012; IEA[8], 2014). As earlier mentioned, energy and forests are two major sources of GHG emissions. Energy emissions from fuel combustion, including power supply, and fugitive emissions (e.g. gas flaring activities) are major sources of GHG emissions in Nigeria (Department of Climate Change, 2018). Although forests, are considered to provide a carbon sink for the absorption of CO_2 emissions, they also contribute to an increase in GHG emissions (second to fossil fuel combustion) as a result of economic development activities including timber logging, mining, intensive land use for agriculture, urban and infrastructural development and deforestation (Pan et al., 2010) - a major environmental challenge in Nigeria (UN-REDD, 2012 and FAO, 2016).

[6] National Aeronautics and Space Administration.
[7] Intergovernmental Panel on Climate Change.
[8] International Energy Agency.

Romani et al. (2012) suggest that the rising trend in emissions could lead to developing countries emitting as much as 37 - 38 billion tonnes of GHG by 2030. For instance, Nigeria, an oil producing country in SSA has quickly become a significant contributor to GHG emissions, due to its developing oil and gas industries (Oluduro, 2012; Ajayi & Ajayi, 2013; Achike & Onoja, 2014). This has also been reported as a side-effect of the rapid economic growth in many natural resource-rich SSA countries (Mjimba, 2014 and Omilola, 2014). While the need for economic development is eminent, on the other hand are socio-economic challenges (low financial and technological capability and poor access to income, energy and forests) of developing countries (Lanzi & Parrazo, 2010 and Jakob & Stekel, 2016). These socio-economic challenges, together with the need to develop their economy, may restrict their full commitment to a low carbon or carbon-neutral economy by 2050.

While it is widely agreed that much more radical steps will be needed globally, if a target of a global CO_2 emissions below 2^oC is to be achieved, there are potential socio-economic constraints (e.g. need for economic development and poverty eradication; weak institutional capacity including low financial and technological capability; poor access to income, energy and forests) upon achieving this goal in developing countries. As pointed out in Article 4.7 of the UNFCCC Convention: "....economic and social development, and poverty eradication are the first and overriding priorities of the developing country Parties" (United Nations, 1992: 8). Although, some resource-wealthy countries have in some ways bought into the idea of a low carbon economy, they are still displaying some caution to giving full commitment to it (Farouk, 2012 and OECD, 2012), as they argue that it may affect their socio-economic development (Farouk, 2012). For instance, in regards to Africa, Farouk (2012) made reference to Botswana, Ghana, Kenya, Nigeria and South Africa as countries which have been actively engaged in the low carbon development concept, however, haphazardly. Many of the projects and policies in place are still disjointed and unrealistic to the imperatives of the low carbon development concept. Klein et al. (2013) comparative study on Benin, Ethiopia, Ghana, Namibia and Nigeria revealed that, apart from Ethiopia, other countries studied do not have coherent low carbon development strategies in place. In reference to Nigeria, Eleri et al. (2011) point out that, apart from the different disjointed and uncoordinated low-carbon development framework by different agencies and institutions in the country, Nigeria does not have a nationally endorsed framework.

A major reason for the caution of fully committing to a carbon-neutral economy is particularly owing to the fact that a majority of African countries are wary of the demand and implications of fully transitioning to a carbon-neutral economy. They argue that the carbon-neutral concept is not a cure for their immediate priorities, which include poverty eradication and economic development, and point out that climate change mitigation strategies must be inclusive of the region's economic growth and development needs (Farouk, 2012). Moreover, it is argued that the economic capability to adopt and implement low-carbon development varies among countries (AfDB, 2012; OECD, 2012; Omilola, 2014). Whereas, developed countries already possess the power to intensify their economic growth with various green technologies (Farouk, 2012), developing countries do not have the capacity to compete with developed countries in the full adoption of carbon-neutral economy by 2050, and are wary that a full commitment, without the full financial and technological capacity to transition and scale-up low carbon energy, may jeopardise their socio-economic development aspirations (Farouk, 2012 and OECD, 2012). For instance, many studies (e.g. Stern, 2006; Diechmann et al., 2011; Eleri et al., 2011; OECD, 2012) point out that the high initial costs of transition seem to exceed the financial capability of developing countries and financing the high cost of eco-technologies may not be consistent with their individual development needs.

The low-carbon development pathway, being relied upon to greatly reduce emissions from energy and land use, was developed by donors (e.g. World Bank, OECD, UNEP[9], AFDB[10]) as a response to help developing countries tackle climate change (World Bank, 2012; OECD, 2012; AfDB, 2014; Omilola, 2014). It is suggested that a win-win scenario for developing economies would mean that their climate change mitigation policies are in synch with development objectives (Cosbey, 2009). However, scholars argue that while global climate change mitigation policies including the carbon-neutral concept have been promoted as a win-win solution, practical challenges remain for developing countries as some climate change mitigation strategies conflict with their development needs and may invoke social and economic impacts on the poor. Consequently, the conflicting strategies may lead to the failure of policy implementation. For instance, while many African countries are making efforts to contribute to the global effort to reduce global warming below 2^{o}C, they struggle with effective

[9] United Nations Environmental Programme.
[10] African Development Bank.

policy enforcement due to social and economic issues (Kula, 2013; Mburia, 2015; Ampaire et al., 2017) and policies which conflict with their economic goals.

Conflicting policy objectives are reported as a major challenge to environmental policy implementation in RDDCs (e.g. Edoho & Dibie, 2000; Kalaba, 2015; Howe et al., 2017; United Nations, 2017). Edoho & Dibie (2000) link conflicting policy objectives in Nigeria with the issue of copycat' environmental policies, which have often not been tailored to the local countries' socio-economic contexts. However, it is argued that tailoring environmental policy objectives to local contexts is critical for the implementation of climate change mitigation policies. Taking into account local circumstances is of utmost importance, as what may constitute a successful strategy to climate change in one region, may not be beneficial in another; and climate policy suited to a group may create adverse impacts on another group's livelihood or access to resources (Eriksen et al., 2011). Swart (2008); Pegels (2015); Nordensvard (2017) argue that, in the context of low-carbon development as a mitigation measure, there are trade-offs for vulnerable communities, which cannot be ignored. For instance, in relation to low-carbon energy, some scholars argue that, although biofuels, for instance, may serve to mitigate GHG emissions, their production could entail increased food prices and water scarcity (Swart, 2008; Levy & Patz, 2015; Jakob & Stekel, 2016). Hussein et al. (2013) warned of land grabbing as a result of the expansion of biofuels production in many RDDCs with weak governance systems that undermine systems of justice.

Furthermore, besides the challenge for the governments, the additional costs of low carbon fuels and technologies when compared to conventional ones also poses challenges for resource-poor people in regards to adopting low carbon fuels and technologies. The issue of additional costs of low carbon energy and technologies have prompted concerns for energy security for less developed countries and poor people (Mohammed et al., 2013; Owen et al., 2013; Sokona et al., 2012). Levy & Patz (2015) and Pegels (2015) warned of the detrimental effect low-carbon strategies may have on the incomes of poor people. For instance, some countries might increase their energy prices to offset the cost of low carbon energy. This, together with the existing poor access and affordability of low carbon energy, can further exacerbate energy poverty and force economically deprived groups to use highly polluting biomass or wood fuels, which may adversely impact on the environment and climate change mitigation goals. For instance, an accelerated low-carbon intervention could conflict with the provision of

sustainable and affordable access to energy in Nigeria, due to its challenges of inadequate supply of electricity, and thus reduce the adoption of energy-efficient practices by resource-poor households.

Similarly, mitigation policies to reduce deforestation have been suggested to have direct or indirect negative social and economic impacts on many forest-dependent people and communities. This includes the forceful eviction from forests, loss of income and livelihood from forest resources, due to the need to promote radical forest conservation. In addition, forest-dependent communities are faced with the challenges of land tenure insecurities, poor benefit payment arrangements, and poor access to information on the tradeoffs of forest management measures, and exclusion from forest management policy decision-making processes (Brockington & Igoe 2006; Agrawal & Redford, 2009; Bayrak & Marafa, 2016). Consequently, the implementation of forest management policy, without consideration of the local socio-economic contexts and provision of social safeguards for the poor, may promote poor commitment to the conservation of forests.

Although, much has been reported on various factors that have constrained the implementation of environmental policies in developing countries (e.g. Edoho & Dibie, 2000; Oliveira, 2009; Oladipo, 2010; Kalaba, 2016), current socio-economic challenges of enforcing climate change mitigation policy in such regions remain under-explored.

Overview of Nigeria's Political, Socio-economic and Environmental Profile

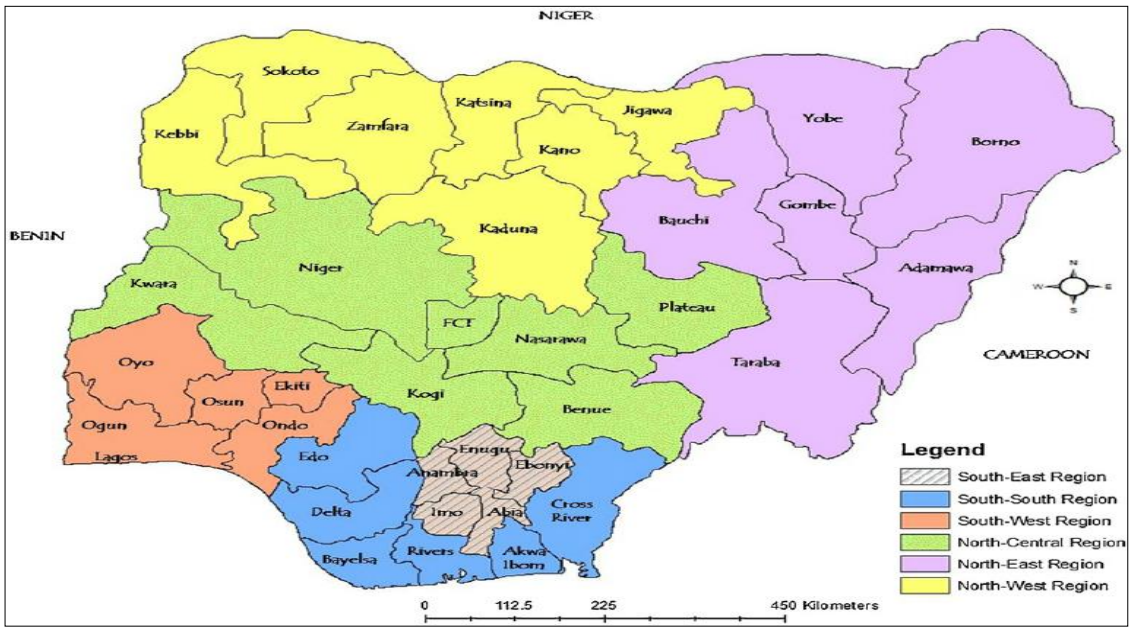
Nigeria is located on the south coast of West Africa, within the SSA region, and covers an approximate landmass area of 925,796 km^2. Nigeria, a population of over 206 million people, is the most populous country in Africa (World Bank, 2020), and the 6^{th} most populous in the world (CIA, 2021).

Nigeria is a multi-ethnic country with diverse cultures and religions. Figure 1.1 below is the geopolitical map of Nigeria. It operates a federal system of government, and covers six geopolitical zones (North Central, North East, North West, South East, South South, and South West), comprising 1 Federal Capital Territory and 36 States, which are sub-divided into 774

Local Governments areas (Federal Government of Nigeria, 2012). Nigeria's constitution (1999) provides for separation of powers among three branches of government - the Executive, the Legislature and Judiciary. See Figure 1.2 for an organogram of Nigeria's governing structure as relates to the environmental sector's governance.

Besides the governance structure, some non-governmental organisations (NGOs) and private sector operators also collaborate with the government in Nigeria's effort to reduce deforestation and increase access to renewable energy (Department of Climate Change, 2018). For instance, NGOs have been mostly involved in the efforts of the government to reduce deforestation. Some of the efforts include raising awareness of forest degradation and deforestation, and promoting sustainable forest management (Federal Republic of Nigeria, 2013). In regards to renewable energy development, some solar energy, small hydropower plants and efficient cooking stove projects in some rural areas have been undertaken through a public-private partnership (Eleri et al., 2013). One example of the private sectors' role in relation to renewable energy development is the GVE rural electrification scheme, which is designed to provide clean and reliable energy to off-grid rural communities in Nigeria. It is a Pay-As-You-Go revenue collection system by a private developer. The project aims to support Nigeria’s target of energy access by 2030. To this end, mini electricity distribution grids, each with an installed capacity of between 24kW to 500kW will be constructed in 72 villages across seven states in Nigeria. Upon completion of the projects, about 73,500 people will have access to energy. There are 13 operational sites to date, with a total installed capacity of 650 kilowatts peak (kWp). This will be scaled up to 17.8MW over the course of the projects. As at 2017, about 10 projects have been implemented (Camco Clean Energy, 2019 and GVE Projects Limited, 2019). In addition, there are other small scale renewable energy and efficiency projects serving rural communities. As of 2015, 115 MW off-grid solar PV capacity had been installed through mini-grid and standalone systems by 53 private developers. In 2017 the installation of two solar mini-grids, two solar kiosks and two solar dryers for agricultural processing were established in different rural communities in Kaduna, Nigeria, by a private company - Sosai Renewable Energies Company (SE4All, 2019).

Figure 1.1: Map of Nigeria showing the six geopolitical zones.



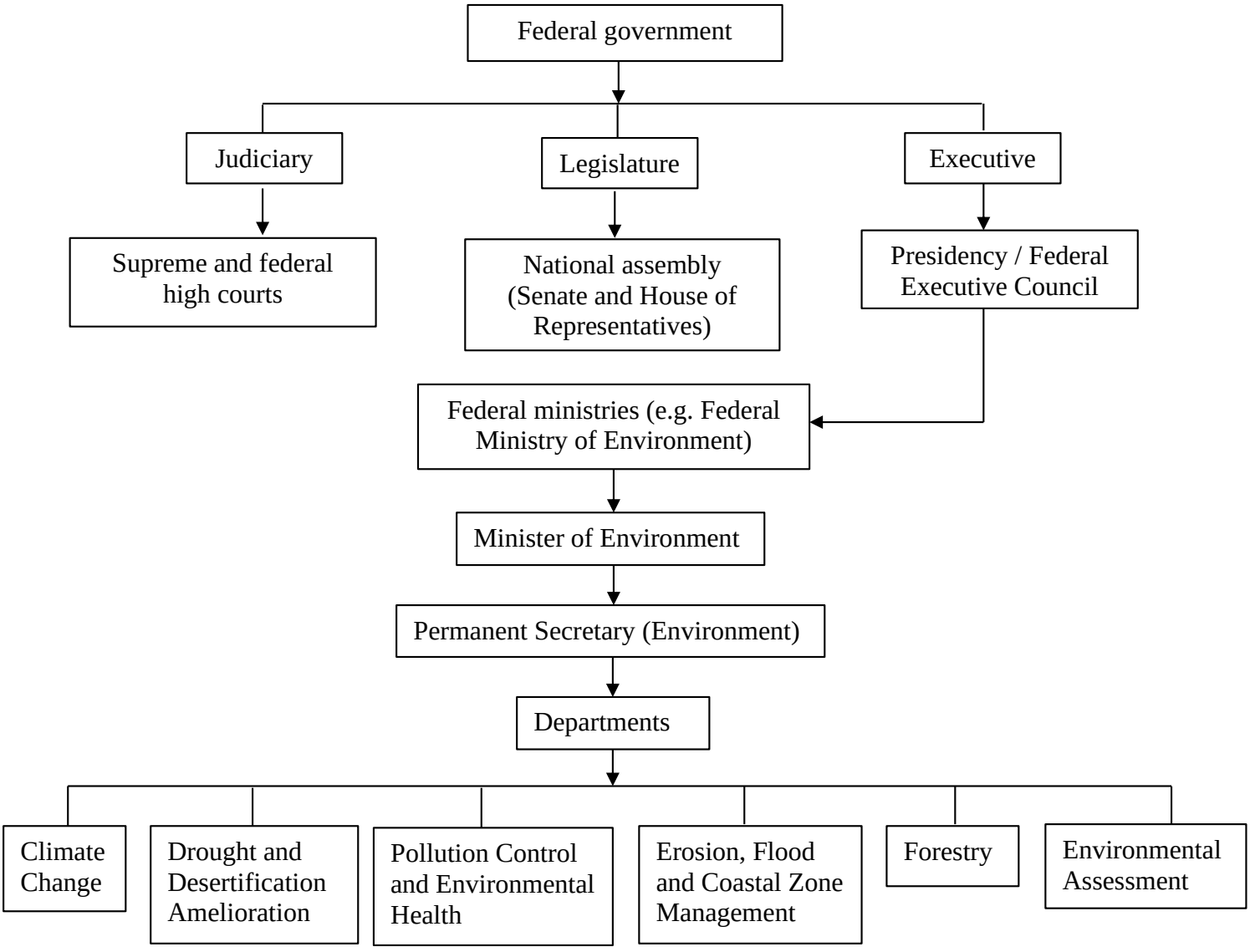
Source: After Ekong et al. (2012).

Nigeria is rich in various natural resources including, crude oil, gas, coal, tin, iron ore, limestone, lead, zinc, niobium, arable land, solar, hydro and biomass. It is the biggest oil exporter in Africa, with vast fossil fuel resources, including an estimated 37.5 billion barrels of crude oil reserves and 5.3 trillion cubic meters natural gas reserves at the end of 2018 (British Petroleum, 2019). The oil and gas sector is the mainstay of Nigeria's economy, and about 90 per cent of Nigeria's revenue is from oil exports (Koblowsky & Speranza, 2012 and Okonkwo, 2015). As of 2019, about 65 per cent of the government revenue and 88 per cent of its foreign exchange earnings were from the oil and gas industry (KMPG, 2019).

Aside from the oil and gas sector, Nigeria's second economic mainstay is agriculture. Nigeria is the largest cereal and meat producer in West Africa, and one third of Nigeria’s GDP and about two-thirds of employment is covered by the agricultural sector (Chete et al., 2016). Agriculture is supported with the vast area of land mass and forests in Nigeria. The country's forests represent sources of livelihood for over 100 million people who directly depend on agriculture (UN-REDD, 2012), and employment for over two million people, through supply of fuel wood and poles, with over 80,000 people working in the log processing industries in the southern part of the country alone (Cross River State, 2017). Besides agriculture and

employment, Nigeria's forests also provide other social and economic resources including non-timber forest products (NTFPs) and energy for rural communities.

Figure 1.2: Organogram of Nigeria's governing structure.



Source: Author's compilation (2021).

Nigeria also derives a small proportion of its income from other sectors, which include manufacturing, mining and utilities. However, these sectors have witnessed low growth due to infrastructural setbacks and relative neglect, owing to much focus on the oil sector (Chete et al., 2016). For instance, the agricultural sector, which was previously the major driver of the country's economy, has reduced to 40 per cent of the country's GDP (AfDB, 2013). This presents a socio-economic challenge for Nigeria because, in spite of its natural resource wealth,

over 60 per cent of the population are living in poverty (AfDB, 2013 and Okonkwo & Uwazie, 2015), especially among the rural population (National Bureau of Statistics, 2017 and World Bank, 2017)[11]. According to the National Bureau of Statistics (2017), the absolute poverty per capita in Nigeria in 2010 was 62.6 per cent. Of which, 51.2 per cent was in urban areas and 69.0 per cent was recorded in rural areas in the same year. Nigeria is rated among the poorest countries in the world and ranks low in all socio-economic indicators, with poor access to basic needs (electricity, food, clothing, adequate shelter, sanitation facilities, safe drinking water, education, good healthcare and access to information) (AfDB, 2013; Ewetan and Urhie, 2014; Ngbea and Achunike, 2014). Forest-dependent communities represent a larger number (over 50 per cent) of the population who are poor and depend on forest for basic needs (National Bureau of Statistics, 2017).

Distinct to each geopolitical zone are varying issues of unsustainable energy activities and environmental degradation. For instance, whereas, the oil sector occupies a major position in Nigeria's economy, it also subjects the country to being the second largest gas flarer in the world, after Russia, and Africa's second largest emitter of greenhouse gases, after South Africa (Koblowsky & Speranza, 2012). Subsequently, environmental degradation has been a particular challenge for the southern part of Nigeria for many years (Koblowsky & Speranza, 2012; Elias & Omojola, 2015; Okoh, 2015).

Another major challenge for Nigeria is that, in spite of its natural resource wealth, it still lacks the capacity to meet its energy demands (Salau, 2015 and Chete et al., 2016). About 55 per cent of Nigeria's population lacks access to sustainable energy supply, and over 80 per cent, especially the rural population, still depend on traditional biomass as their source of energy (IEA, 2014). Poor power generation and fluctuation in supply have affected the country's economy, as businesses cannot function without power supply and many have seen their machinery and electrical equipment damaged as a result (Chete et al., 2016). Although there has been recent progress in energy supply and a gradual move to renewable energy in some states, they are not sufficient to address the country's growing demand. For example, it is forecasted that Nigeria's energy demand will considerably increase yearly (Energy Commission of Nigeria, 2014 and Salau, 2015). A study by the Energy Commission of Nigeria

[11]Rural poverty was recorded as 69.0 percent in 2010 (National Bureau of Statistics, 2017).

(2014), projects that, following a 7 per cent growth rate, demand will reach 115,674 MW in 2030. Another study by Salau, (2015) shows a forecast of 250,000 MW in 2030. Both forecasts represent a substantial increase from 24,380 MW in 2015, 45,490 MW in 2020 and 79,798 MW in 2025 (see Energy Commission of Nigeria, 2014). The forecasted increase in energy demand further escalates the current vast use of diesel- and petrol-powered generators, which contributes to fossil fuel emissions, and an increased use of fuelwood, also argued to be contributing to forest degradation in the country (Onwuka, 2006; Babagana et al., 2012; Okoruwa, 2014). These factors also pose challenges to the actualisation of Nigeria's climate change mitigation goals by 2030 and 2050.

Further to energy pollution is the challenge of deforestation in Nigeria. Nigeria is one of the countries with the highest deforestation rates in the world, with over 450,0000 hectares of forest lost yearly (Federal Ministry of Environment, 2015 and FAO, 2019). For instance, between 1900 - 2000 Nigeria was reported to have lost more than 90 per cent of its primary forest, due to unsustainable activities, including infrastructural development, uncontrolled logging of forests (Olagunju, 2015; FAO, 2016; Matakala, 2016), the establishment of state-owned agricultural plantations (such as cocoa and oil palm), and mining (FAO, 2016). Between 2000 and 2010, the land area covered by forest was estimated to have shrunk by one third from 14.4 per cent to 9.9 per cent, with the highest rates of deforestation recorded in Ogun, Ondo, Edo, Delta, Taraba and Cross River States (Federal Republic of Nigeria, 2013 and Global Forest Watch, 2021). A recent data by Global Forest Watch (2021) shows that between 2002 and 2020, Nigeria lost 14 per cent of its total tree cover. Hence, a major part of Nigeria's climate change mitigation response is to reduce deforestation (Federal Ministry of Environment, 2015). However, as previously mentioned in the *"Climate Mitigation and Implementation Challenge in RDDC"* section, Nigeria faces challenges in the implementation of its forest management policies, due to various social and economic factors. For instance, in addition to weak technical capacity, poor enforcement, and corrupt governance practices, which promote large corporate illegal logging, poorer households and communities disproportionately dependent upon the natural resource base are often marginalised and forcefully banned from the forests (their source of livelihood). Consequently, these vulnerable populations are compelled to overexploit the forest (against their own long-term interests) as well as collude with commercial loggers in a desperate bid to survive, contributing to deforestation and degradation of the forests (Watts, 2018).

Understanding Mitigation Policies through Policymaking and Implementation Perspectives

An in-depth understanding of the constraints of policy enforcement can be achieved through examining the policy-making and implementation processes. This study builds on the Contextual Interaction Theory, developed by Hans Bressers in the 1990s to understand the factors that affect policy implementation, and which has been widely used in the analysis of environmental policies (see Owens, 2008; Bressers & Lulofs, 2010; de Boer et al., 2013). As further explained in Chapter 2, the theory lays emphasis on actor characteristics (information, motivation, resources) and their influence on policy implementation, and puts an emphasis on the contextualisation of the governing process in regards to local status. This is especially pertinent to Nigeria as previous studies have pointed out the ignorance of socio-economic challenges by policy actors is a key hindrance to policy enforcement (Nwosu et al., 2015). CIT draws attention to the complexity of policy implementation and how the understanding of the local context and actor characteristics can be useful in ascertaining the acceptability and feasibility of, and resistance to, policy interventions. This understanding is crucial because as established in the literature on policymaking and implementation, there are often complexities of turning ideas into actions (Smith, 1973; O'Toole, 2000; Bhuyan, 2010; Mthethwa, 2012). As such, a policy intervention may not always achieve its intended outcomes, regardless of their good intentions (see Hajer, 1997; Keeley & Scoones, 2000; O'Toole, 2000). With this in mind, scholars argue that the process of policy implementation should therefore be undertaken with the deliberate view to understanding and addressing the root cause of the barriers to the intended goals. This includes finding ways to manage the complexities or constraints that may hinder achievement of the intended outcomes (Bhuyan et al., 2010 and Health Policy Project, 2014). Such barriers in the RDDCs' context include socio-economic impacts of climate change mitigation measures and resistance to such measures.

This research aims to understand the socio-economic constraints upon the implementation of climate change mitigation policies within the Nigerian context. This includes the understanding of resources and their influence on policy implementation. In regards to the socio-economic context of RDDCs, it can be argued that the dependence on resources for socio-economic development, the threats of loss of income and livelihood, and poor access to

resources may shape the implementation of climate change mitigation policies. Thus, in addition to employing the contextual interaction theory, I also build on the concept of resistance to policy change to investigate and provide an in-depth analysis of the potential socio-economic constraints upon the implementation of climate change mitigation in Nigeria.

Nigeria's Climate Change Mitigation Policy Response: How Understanding the Nigerian Experience Contributes to Better Climate Change Mitigation

Nigeria helps to extend conceptual and empirical understandings of the challenges of implementing climate mitigation policies in RDDCs for several reasons. First, as mentioned earlier, Nigeria is a typical example of a RDDC struggling with widespread poverty, poor access to adequate energy resources, increased dependence on its natural resources, and the need to develop its economy with its natural resources. Nigeria is also faced with environmental challenges, such as deforestation and energy pollution associated with fossil fuels production and consumption. Second, it has a historically poor implementation of environmental policies (Nwufo, 2010; Koblowsky & Speranza, 2012; Okoh, 2015) due to various political and structural challenges (e.g. weak institutional capacity, poor enforcement and corrupt governance practices, the prioritising of economic interests and regulatory gaps).

Existing evidence shows that weak institutional capacity is one of the obstacles to successful environmental policy implementation in Nigeria. In addition to a lack of fund and technical inadequacy (Hussaini 2015 and Okoh 2015), Oladipo (2010) and Hussaini (2015) report that low staff levels and human capacity development in all areas of climate change analysis, pose a challenge to the effective formulation, implementation and monitoring of climate actions in Nigeria. Husain (2014) argues that unawareness of environmental issues and poor expertise of some government agency officials, make it difficult to effectively formulate and implement environmental and climate-related policies in Nigeria.

Other scholars report issues of poor inter-agency coordination, disconnection between different levels of government agencies, a top-down approach to environmental policy implementation and the poor participation of stakeholders as barriers to the implementation of climate change policies in Nigeria (e.g. Oladipo, 2010; Eleri et al., 2011; Amobi & Onyishi, 2015). Using

Lagos State, Nigeria as an example of the challenges of policy implementation, Elias & Omojola (2015), who conducted a case study on the challenges of implementing climate change policies, reveal that, although Lagos State authorities have recently gradually started responding to the issues of climate change, the efforts made so far are disorganised, largely top-down, and faced with poor participation of stakeholders in decision-making. For Amobi & Onyishi (2015) the top-down approach and poor participation of stakeholders in environmental policy in Nigeria is a reflection of the government's conventional approach, which often fails to engage local stakeholders in policymaking and implementation.

In addition, economic interest in natural resources and weak political will are reported in the literature as major factors that affect the implementation of environmental policies and support or drive to implement low carbon energy (Edoho & Dibie, 2000; Amechi, 2009; Osunmuyiwa & Kalfagianni, 2017). Amechi points to how environmental regulations against extractive industries have not been enforced, due to the economic benefits, including revenue and employment, derived from the oil and gas polluting industries. In examining the issues of low-carbon energy implementation in Nigeria, Osunmuyiwa and Kalfagianni (2017) identified weak political will, linked to the dependence on oil rents as a barrier to the transition to renewable energy development in Nigeria. Osunmuyiwa & Kalfagianni's (2017) research on renewable energy transitions in Nigeria described how actors including government representatives and political elites with vested interests in the oil and gas industries, engage in different political strategies to block some attempts of low-carbon energy development, in order to retain the status quo. Although the development of renewable energy is gradually progressing in Nigeria, some of the large scale importers of diesel and petrol generators, are reported to be promoting the predominant use of fossil fuel through the increased use of diesel and petrol generators. For instance, Osunmuyiwa and colleague reported that between 2011 and 2015, the government's decisions on energy was influenced by some political leaders and government representatives, in order to promote the expansion of oil and gas resources in Nigeria.

Given the political, institutional, and economic challenges of Nigeria, it is not surprising that the government capacity to address the variety of environmental problems in the country is rather weak (Watts, 2018). Although Nigeria's per capita CO_2 emission is presently very low, its CO_2 emission per unit of GDP is over twice the global average (Elum & Mjimba, 2016). If

a business-as-usual approach to economic growth is followed, the Federal Ministry of Environment (2015) reveals that Nigeria's emissions will drastically increase by an estimated 114 per cent by 2030 to around 900 million tonnes. In case of higher growth scenario, the emission would amount to over 1 billion tonnes. As such, including the impacts of climate change on its economy, Nigeria is keen to promote a sustainable economy, and recognises the importance of an ambitious mitigation action for its economic growth. For instance, in line with its Nationally Determined Contributions (NDC) goals, Nigeria pledged to ending gas flaring by the year 2030, with a target emission reduction of 45 per cent (Federal Ministry of Environment, 2015), and has considered high-emitting sectors, which include energy, forests, agriculture, transportation and communications, industry and commerce (UNFCCC, 2015). However, many scholars point out the growing need for improved climate change governance in Nigeria (e.g. Akinbami, 2001; Koblowsky & Speranza, 2012; Elias & Omojola, 2015). For Akinbami (2001), the available policies for tackling climate change remain broad and not fit for providing the required response to the country's climate change concerns. Similarly, the Federal Ministry of Environment (2010) argue that climate change response demand strategic approaches from policy, regulatory and institutional frameworks, and the capacities to achieve them.

Still, it is important to note that Nigeria has laws in place to address environmental degradation, only that there has not been much success achieved to date in translating these laws and policies to actions (Watts, 2018). For instance, in line with its climate change mitigation goals, Nigeria developed the National Climate Change Policy Response and Strategy (NCCPRS) in 2012 to promote a low-carbon, high growth economic development path whilst building a climate-resilient society. In addition to the NCCPRS, Nigeria documented its First Nationally Determined Contributions (NDC) in 2015, (updated in 2021). NDCs provide countries' targets for the reductions in GHG emissions under the UNFCCC. Nigeria's NDC, issued by the Federal Government and pursued by the Federal Ministry of Environment, is a multi-sectoral policy document for the period of 2015-2030. It is in line with the objectives of the NCCPRS and the enforcement of existing energy and forest policies. Although, it is a voluntary climate action which is based on the country's national status and priorities, some components of its NDC (e.g. to pursue domestic mitigation measures and regularly provide information on the country's national inventory of emissions) are legally binding (Federal Ministry of Environment, 2015).

In 2009, Nigeria's Federal Ministry of Environment adopted the Reducing Emissions from Deforestation and Forest Degradation (REDD+) programme to address deforestation. REDD+ is an international market-based climate change mitigation instrument, which was negotiated under the UNFCCC in 2005. Its main objective is central to climate change mitigation by reducing GHG emissions through enhanced forest management in developing countries. This includes promoting positive forest and land use behaviour, in order to reduce deforestation and forest degradation, through financial incentives to developing countries, who achieve measurable emission reduction from forest sources. The REDD+ goal in Nigeria is to facilitate the country's climate change mitigation commitment by intensifying forest conservation and sustainable community livelihoods (UN-REDD, 2012). The REDD+ goal is also a key objective of Nigeria's NDC and the NCCPRS.

Several environmental policies and action plans that have been enacted in Nigeria were also adapted to support national climate change mitigation efforts. Some examples include the National Renewable Energy and Energy Efficiency Policy (NREEEP), Renewable Energy Master Plan and National Forest Policy. These energy policies also aim to drive the renewable energy and energy efficiency goals of the NCCPRS and NDC.

However, the question is to what extent have these documented policies to mitigate climate change been implemented? What factors influence or constrain their successful implementation in Nigeria? These questions are critical, given the historical challenge of implementing environmental policies in Nigeria. Yet, while the understanding of the political and institutional factors is important to the implementation of environmental and climate change policies, it is also critical to focus on socio-economic issues amongst the resource-poor in explaining the obstacles to climate change mitigation policy implementation. In pursuing a socio-economic focus, this thesis makes an original contribution to the environmental policy/management literatures as I argue that a more strategic approach that speaks to Nigeria’s socio-economic contexts, such as the competing goals of material development, and socio-economic insecurity is important in the formulation and implementation of climate change mitigation policies.

The understanding of the socio-economic factors is important in the implementation of climate change mitigation measures in RDDCs because the region's low-carbon development is

complicated by the consideration of socio-economic factors, including the dependence on resources, poverty, increased rate of unemployment, poor access to resources (e.g. energy and land). However, the environmental policy implementation literature is sparse on providing in-depth insights into the socio-economic complexities of, and constraints upon, implementing climate change mitigation policies in a RDDCs' socio-economic context. For example, I searched Scopus[12] and Google Scholar for publications between 2005 and 2015 using the following key terms: barriers to the implementation of climate change mitigation policies in Nigeria, constraints upon the implementation of climate change mitigation policies in Nigeria, challenges to climate change mitigation policy implementation, socio-economic barriers to the implementation of climate change mitigation policies in Nigeria, socio-economic constraints upon the implementation of climate change mitigation policies in Nigeria, barriers to the implementation of low-carbon development in Nigeria. Using these terms, I found only 33 related scholarly articles. Further items of literature were identified through a review of reference lists of relevant literature. So far, there appears to be a shortage of data and empirical studies on the constraints upon the implementation of climate change mitigation policies in Nigeria, especially in relation to the socio-economic constraints. In much of the literature I explored, the focus is on the institutional constraints upon the implementation of climate policies in Nigeria, such as regulatory, policy inconsistency (Oladipo 2010 and Okoh, 2015), weak political will in implementation of climate change policies (e.g. Onyekuru & Marchant, 2012; Husain, 2014; Amobi & Onyishi, 2015) and economic interests and pressure from the oil and gas industry (Edoho & Dibie, 2000; Eleri et al., 2011; Osunmuyiwa & Kalfagianni, 2017) as discussed earlier. Following this background knowledge on the challenges of environmental policy implementation in Nigeria, I outline, in the next section, the questions and objectives that guided this study.

Research Questions and Objectives

The central focus of this research is to deepen our knowledge on the socio-economic constraints upon the implementation of climate change mitigation policies in Nigeria, in light of its RDDCs' socio-economic contexts. By comprehending how constraints upon the implementation of

[12] Scopus is a database of abstracts and citations for peer-reviewed or academic journal articles

climate change mitigation policy may emerge, and identifying possible responses to them, this research will inform the formation and effective implementation of climate change mitigation policies in Nigeria, and possibly other African countries with similar challenges. Based on the aims and objectives of this research, the key question of this thesis is: how is the implementation of climate change mitigation policies is unfolding in Nigeria in light of its socio-economic contexts? Taking the low carbon energy and energy efficiency policies, and forest management policies as two case studies, this study addresses the following research questions:

1. To what extent are the climate change mitigation policies being implemented in Nigeria?
2. What are the main socio-economic factors that affect Nigeria's implementation of climate change mitigation policies?
3. How do these factors pose constraints upon the implementation of Nigeria's climate change mitigation policies?

Outline of the Thesis

Following this introductory chapter, Chapter 2 provides the theoretical and analytical frameworks that informed this study. This is followed in Chapter 3 by an explanation of the methodology applied in this study. This chapter describes the methods of data collection and analysis to answer the research questions. In addition, it discusses the strategies that were employed to ensure ethical research practices and improved research quality. Chapters 4, 5 and 6 are the empirical chapters presenting my research findings and addressing the research questions. All three chapters build on the theoretical and analytical frameworks in Chapter 2, and the findings on implementation of energy (Chapter 4 and 5) and forest management (Chapter 6) policies, to present an analysis on the constraints upon the implementation of climate change policies in Nigeria. The aim here is to further the understanding of the complexities of implementing climate change mitigation policies in the RDDCs' contexts. This includes understanding the socio-economic impacts of climate change mitigation measures and the effects of those impacts upon the implementation of climate change mitigation policies in Nigeria. Thus, Chapter 4 is a case study and evaluation of the implementation of climate change mitigation policy to date in Nigeria, with reference to the deployment of low-carbon energy.

This is followed by an evaluation of the adoption of renewable energy and energy-efficient technologies in Chapter 5. Chapter 6 is a case study on the implementation of forest management, with reference to REDD+ in RDDCs. This chapter presents an extensive review on the complexities and conflicting roles of implementing mitigation measures, such as forest management in RDDCs. This review is followed by the empirical findings on the mitigation policies in place to address deforestation and forest degradation to date in Nigeria. Lastly, Chapter 7 provides a summary and discussion of the research findings, reflection on the implication of these findings for low-carbon development in Nigeria and other RDDCs, and conclusions of the research.

CHAPTER 2

Conceptual and Analytical frameworks

Introduction

This chapter reviews the literature on policy implementation. The aim of the chapter is to identify, in existing studies, the factors that shape environmental policy implementation in the context of RDDCs and resource-poor people. The chapter is divided into 3 parts. Part One reviews literature on policymaking and implementation processes in RDDCs. Part Two examines the Contextual Interaction Theory, and concept of resistance to policy change, and application to low-carbon energy development and forest management policies in RDDCs. Based on discussions in Parts One and Two, Part Three proposes an analytical framework for the socio-economic constraints on climate change mitigation.

PART ONE

Policy Implementation and Challenges in RDDCs: An Overview

Policymaking is a process whereby problems are identified, solutions evaluated, and choices made by actors in power to formulate and implement policies (Keeley & Scoones, 2000). The implementation of policies involves "the execution of the law in which various stakeholders, organisations, procedures, and techniques work together to put polices into effect for attaining policy goals" (Khan, 2016: 540). However, it would be naive to assume that policy will be automatically implemented once developed (Smith, 1973; Alesch & Petak, 2002; Health Policy Project, 2014). Irrespective of how a policy was formulated, with the best intentions, or based on the most successful models, they can still fail to meet the desired goals (Alesch & Petak, 2002; Khan, 2016; Signe, 2017). For instance, globally, while many well intended environmental policies (e.g. policies to reduce gas flaring, household energy emission, and deforestation) are formulated and adopted, they may still fail to meet desired outcomes due to the complex delivery process (Smith, 1973; McLaughlin, 1987; O'Toole, 2000; Bhuyan, 2010; Mthethwa, 2012) including the social impacts that the policy interventions may have on the public and / or the infeasibility of the policies, conflicting policy goals, socio-economic constraints which cumulatively render difficult the actualisation of policies goals. Different stakeholders often need to work through an entangled web of interests which inevitably

constrain the legitimacy and/or prioritisation of the policy objectives (Smith, 1973; Bhuyan, 2010; Mthethwa, 2012; Health Policy Project, 2014).

In relation to developing countries, Smith (1973) highlighted that economic feasibility is a key challenge, and a significant factor in the complexities and failures in policy implementation. This is especially so, if the policy is driven by conflicting goals of different social, economic and political interests or groups. For instance, the need to reduce the use of fuelwood and diesel generators may conflict with the need for low carbon energy for cooking and heating in RDDCs, due to poor access to energy in the region. I discuss, in subsequent sections and chapters, socio-economic factors that may affect climate change policy implementation including governments' commitment to the deployment of renewable energy, as well as the sustained adoption of renewable energy and energy-efficient technologies, and forest conservation practices by resource-poor people in RDDCs like Nigeria.

As highlighted in Chapter 1, several studies on RDDCs have identified various barriers to environmental policy implementation to including weak legal framework, conflicting policy objectives, weak political will by governments or the desire to support or fund interventions and sectors, economic interest, dependence on natural resources, weak institutional capacity, poor access to information and exclusion in policy and decision-making, and lack of environmental awareness. In the subsequent sections, I further discuss some of these factors in the context of this study.

Weak Institutional Capacity

As mentioned in Chapter 1, a less investigated area regarding environmental management in RDDCs is the effect of socio-economic contexts (or status) on the challenges of environmental policies implementation. For instance, some authors (e.g. Edoho & Dibie, 2000 and Amechi, 2010) assert that there is a reluctance amongst African governments to enforce environmental laws, due to economic interests. In relation to the transition to a low carbon economy, Amechi (2010) and Osunmuyiwa & Kalfagianni (2017) argue that economic interest in the oil and gas resources is linked to poor political support or drive to implement low carbon energy. However, in addition to political factors, it is also important to understand that the poor support for

environmental policies could be due to weak institutional capacity or socio-economic constraints to implement policies.

As mentioned in Chapter 1, weak institutional capacity is suggested to be a challenge to the implementation of environmental and climate change mitigation policies in RDDCs including Nigeria (see Amechi, 2010; Oladipo, 2010; Hussaini, 2015). Amechi (2010) expressed how it is difficult for the government to enforce environmental regulations, due to their lack of scientific and technical expertise. Amechi gives an example of how toxic waste is trafficked and poorly disposed off in many developing countries, including those in Africa, due to a lack of adequately equipped laboratories for testing and evaluation, and specialised data systems to characterise harmful wastes. As such, they are often unable to adequately determine the nature of toxic substances crossing their borders. Weak institutional capacity to implement environmental policies may stem from various socio-economic factors including financial constraints by the governments to fund environmental sectors. Similar to the argument of Oliveira (2009), Amechi points out that developmental needs, poverty eradication interests and declining national revenues may mean that environmental issues are less feasible or prioritised on, whilst economic and social issues are given greater priorities on most government's agendas in majority of the developing countries. As a result, environmental protection policies suffer from poor implementation by government agencies. In regards to African countries, Mburia (2015) points out that the implementation of climate change policies is especially challenging due to poor capacity to tackle climate change and compelling need for socio-economic development.

From the aforementioned studies, it is clearly visible why comparatively less attention has been given to environmental policies including, for example, the forestry sector. For instance, Kalaba (2015) states that forest policy implementation has often failed in Africa because other economic development policies, such as agriculture and energy, are given more priority over forest preservation policies. This supports the view that reducing forest emissions is not a national priority in countries with poverty and economic development challenges (Oliveira, 2009 and United Nations, 2017). As a result, the forest sector by reason of funds limitation is constrained in effective implementation of programs and protection of its resources (World Bank, 2008 & Alley, 2011). Moreover, in most of the RDDCs, forestry enforcement officers are poorly paid and equipped. Poor salaries make forestry officials susceptible to bribes and

other inducements from illegal logging merchants, a major contributor to deforestation and forest degradation (Amechi, 2010 and Alley, 2011). Low financial capacity is one of the reasons for the poor management of Nigeria's forests (Edoho & Dibie, 2000; FAO & Federal Department of Forestry, 2001; UN-REDD, 2012).

In addition to forest management, the understanding of the socio-economic factors and how they affect the transition to renewable energy in RDDCs is imperative. A good illustration is how Nigeria's desire for low-carbon energy is constrained by financial and technological factors, poor energy supply and increasing energy demand. The dilemma confronting the Nigerian government in the implementation of low-carbon energy is illustrated by the views of its former Minister of Finance at the World Bank / IMF [13] meeting, "Towards Better Infrastructure in Developing Countries", held in 2016. While addressing infrastructure issues and power supply crisis in Nigeria, the Minister made an argument for coal-fired-power to resolve power shortage, noting that full scale adoption of renewable energy is for financial reasons difficult for the country to attain (Vanguard, 2016). The proferred alternative of coal, though not an environmentally friendly option and at variance with the government's policy of low carbon energy, represents the best the country could currently afford given deeper socio-economic issues including poverty, poor access to resources, as well as financial and technological constraints.

Poor Access to Information and Exclusion in Decision-making

Poor access to information about interventions is another factor identified in the literature as a barrier to environmental policy implementation in many African countries (Amechi, 2010; Amobi & Onyishi, 2015; Shane et al., 2016; Ajulor, 2018). Ajulor (2018), amongst other scholars, found that policies were often poorly communicated to target groups in Africa. For instance, State and forest management programme actors may fail to provide adequate information and effectively communicate the socio-economic risks of a forest management project to forest communities. Poor access to adequate information by the public, on the impacts of forest management interventions, for instance, has also been reported in Nigeria (Isyaku, 2017). For instance, amongst the different challenges of the implementation of forest

[13]International Monetary Fund

management programmes (e.g. the REDD+[14] Readiness Programme) in Cross River State, Nigeria, is the poor delivery of adequate information by the REDD+ programme actors to stakeholders, whereby stakeholders were not effectively informed about project meetings, implications and decisions about the project (also see Asiyanbi, 2016; Nuesiri, 2017; Akanni, 2018).

In addition to poor access to information, the absence of effective consultative and participatory approach to policymaking and implementation are contributory factors to poor enforcement in African countries. For instance, forest communities excluded from policy design and decision-making processes may be reluctant to commit to forest conservation, or cause damage to forests, which may result in the poor management of the forests. An example is the implementation of a Superhighway project in Cross River State, Nigeria, which was met with resistance by local communities, as community lands were acquired, without due public consultation or consideration of livelihood (Isyaku, 2017; Affe, 2018; Asiyanbi, et al., 2019) (See Chapter 6). Ajulor (2018) found that policies were often imposed on target groups by the government without considering their impacts on the people. Such moves may jeopardise policy outcomes, as the people may be indifferent to or even go as far as to sabotage well-intended programmes (Ajulor, 2018). This also means that stakeholders may not participate in environmental management programmes, if it negatively impacts on their livelihood or if they have poor access to resources including land or forest products. This is especially the case in RDDCs like Nigeria, where community land rights is not formally recognised (Oyebo et al., 2010 and UN-REDD, 2012).

Lack of Environmental Awareness

At the household and community levels, much of the literature on environmental management and policy implementation identifies socio-cultural factors, lack of environmental awareness, and poor environmental behaviour as constraints upon the implementation of climate change mitigation policies (e.g. renewable energy and energy-efficient, and forest conservation measures). That is, knowledge of environmental issues and climate change amongst most people in Nigeria and other African countries is found to be very poor (Babalola et al., 2010;

[14] Reducing Emissions from Deforestation and Forest Degradation.

Odjugo, 2013; Hussaini, 2015; Ozor et al., 2015). Ozor et al. (2015) report that many people still associate environmental hazards including climate change to cultural and religious beliefs and consequences, such as violation of local customs, wrath of the gods, the end of a sinful generation or punishment from God, and natural phenomena. According to Ozor and colleagues, part of this challenge is due to the lack of information on climate change / environmental issues. As such, the public are often not well equipped to protect the environment.

The lack of awareness is argued to promote a culture of poor environmental behaviour resulting in the excessive use of firewood, illegal logging and unsustainable dependence on forest resources. Consequently, this represents a barrier to the successful implementation of climate change mitigation policies including the adoption of renewable energy and energy-efficient technologies, and forest conservation practices. The poor adoption of energy-efficient cooking practices, for instance, is linked to lack of awareness regarding the benefits of low-carbon fuels and energy-efficient cooking appliances (Clean Cooking Alliance, 2011; Ozoh et al., 2018; Ihemtuge & Aimikhe, 2020). Ozoh et al. (2018) and Ihemtuge & Aimikhe (2020) report the poor adoption of liquified petroleum gas (LPG) as stemming from the poor perception of its risks to health is linked to poor knowledge of low-carbon energy and its benefits for the environment, amongst many people, especially in the rural areas of Nigeria. Scholars, such as Saad & Bugaje (2016) and Akintan et al. (2018) report that socio-cultural norm including preference for tastes, linked to poor environmental awareness, is seen as a key factor that promotes the use of firewood in rural Nigeria. These assertions of environmental unawareness amongst the grassroots citizens in SSA, including Nigeria, is often associated with low level of education and poor environmental awareness / sensitisation campaign. To combat this constraint, there has been a growing call for increased awareness and education on the issues of climate change and poor environmental practices (e.g. Nzeadibe, et al., 2011 and Ojomo, et al., 2015). However, while these studies report that more needs to be done on public awareness of climate change in Nigeria, in a study conducted in the northern part of Nigeria, Farauta et al. (2012) point out that the media has been a major source of information on climate change for the local people. Yet, many of the grassroots people are still not aware of climate change and environmental issues or involved in pro-environmental practices. This implies that although, there is a need for environmental awareness, it is important to understand and consider, in the same magnitude, the main socio-economic constraints of the resource-poor

people in relation to the socio-economic contexts of RDDCs, since their commitment to pro-environmental practices is crucial, if we are to achieve a better sustained impact in the reduction of GHG emissions in RDDCs.

The focus on the increased need to raise awareness for pro-environmental practices could be understood from the position of the global commitment to reduce GHG emissions through collective and individual efforts. For instance, UNESCO (2016) stated that, *"education, awareness-raising and public information play an essential role in increasing the capacity of communities to counter climate change and adapt to its impacts"*. According to Climate-Adapt (2015), public awareness of climate change can help promote enthusiasm and support for individual climate change actions, as well as behavioural change. It forms part of the adaptation process as it helps to build adaptive capacity and reduces vulnerability to the effects of climate change. In encouraging countries to strengthen their national climate change programmes and citizens' engagement in tackling climate change, UNEP (2006) urges governments to take proactive steps in developing and implementing educational programmes, training, public awareness, and participation, including access to information on climate change and its effects. This call for action was also reinforced in the ACE agenda and documented by UNESCO (2016).

However, while the argument of lack of environmental awareness and poor environmental behaviour has resulted in an increasing need for environmental campaign in SSA, so far, the attention has principally focused on changing people's behaviour with little or no attention to addressing the socio-economic constraints such as poor access to resources in relation to the sustained adoption of renewable energy and energy-efficient technologies, and forest conservation practices amongst resource-poor households. For instance, although there are relatively more studies on the adoption of energy-efficient technologies and conservation practices, in general, this is still very scarce in SSA (Gana & Hoppe, 2017). Moreover, most of the existing studies (e.g. Hussaini & Abdul Majid, 2014; Gana & Hoppe, 2017) seem to be focused on the general public (i.e. not specifically on the low-income population) and some are influenced by studies and models outside the socio-economic contexts of RDDCs, which are centered on behavioural approach to analysing environmental measures (e.g. energy adoption and efficiency, and forest conservation practices). The behavioural approach often focuses on the level of education and awareness of the individuals and built on the argument

by previous environmental and psychology scholars that understanding and shaping behaviours can significantly promote pro-environmental behaviour including a significant boost in energy-efficient fuels (e.g. Ehrhardt-Martinez, 2011).

The behavioural approach to environmental management can be understood from the perspective of lack of environmental awareness amongst the general public as reported in existing literature (e.g. Babalola et al., 2010; Odjugo, 2013; Hussaini, 2015; Ozor et al., 2015). However, although previous findings show that for some people, factors characteristics such as perception, awareness and / or educational level can affect their environmental practices, it is, nevertheless, important to understand the main socio-economic factors in the implementation of climate change mitigation measures in regards to the initial and sustained adoption of energy and forest management measures in the context of the resource-poor in RDDCs. According to Hussein et al. (2013) there should be a careful consideration of the resource-poor group in the framing and implementation of climate change mitigation policies, to reduce the negative effects of such measures on them, as well as create an enabling space for them to adopt and continue with such measures in the long term. This point aligns with the argument of Burgess et al. (1998: 1446) that: "the reception of environmental communications and their 'effectiveness' in delivering change in people's attitudes and values, is highly contingent on many factors, not least the local social and cultural contexts in which people live." This point by Burgess and colleagues further lays emphasis on the argument that there is a gap in the understanding of pro-environmental behaviour and their influencing factors in the contexts of RDDCs and the resource-poor people. As mentioned earlier, policy implementation is invariably complicated by social and economic factors, which make their adoption difficult. As such, as Bressers (2004) points out, the isolation of the policy measures from the context they are applied may jeopardise the policy outcomes. This implies that, while there is an increased need to promote environmental awareness for pro-environmental practices, equal consideration must be given to understanding the major socio-economic constraints on the successful implementation of climate change mitigation measures like energy and forest conservation, especially amongst the resource-poor in RDDCs. In the subsequent sections, I further discuss the need for an understanding of the main socio-economic constraints in relation to the adoption of low-carbon energy and forest conservation practices amongst the resource-poor people.

Understanding Socio-economic Constraints upon Low-carbon Energy Measures

The understanding of the socio-economic contexts in relation to the resource-poor households in RDDCs is crucial because while, it is important for citizens to adopt low-carbon energy and energy-efficient technologies, it is imperative that much emphasis is laid on their sustained adoption and use of such technologies (Hesselink & Chappin, 2019). For instance, using clean cookstove as an example, Ruiz-Mercado et al. (2011: 7557), argued that: "no stove program can achieve its goals unless people initially accept the stoves and continue using them on a long-term basis." A study by Puzzolo et al. (2020) on the barriers to the sustained adoption of renewable energies showed that affordability and accessibility to a reliable and affordable fuel supply are some of the major conditions for their adoption and sustained use. Shove (2015), in a study linking low-carbon energy and social practice, points out how the uptake of low-carbon energy by the public is dependent on people's willingness to substitute low-carbon technologies for conventional ones. Using low-carbon electricity and electric cars, for instance, Shove also points out that such willingness could practically be observed where there is availability of technologies to deliver the required power. For Shove, "practices and infrastructures connect, and with electricity in particular, supply and demand are closely interwoven" (Shove, 2015: 6). A few recent studies related to low adoption of renewable energy and energy efficiency practices in Nigeria have also reported the availability and affordability of energy as one of the best options for sustained adoption amongst low-income people (e.g. Oyedepo, 2012; Bisu et al., 2016; Federal Ministry of Power, 2016).

Recently, countries outside SSA are being used to draw experience on the adoption of LPG because of the region's low adoption of LPG amongst low-income households. This is because poor access to energy-efficient cooking is very acute in SSA, with only a slight increase in access from 15 per cent in 2015 to 17 per cent in 2018 (IEA, 2019). Part of the reason for the low adoption of modern energy in the region is also due to the lack of affordability for many households. For instance, to increase the uptake of LPG, Nigeria, amongst other SSA countries, is trying to draw experience from the large-scale adoption of LPG for household energy-efficient cooking in Indonesia, India, and other parts of the world (Federal Ministry of Power, 2016 and Ozoh et al., 2018). Indonesia is cited as an example of how the country's massive multi-phase energy program to convert its primary cooking fuel from kerosene to LPG

in more than 50 million households resulted in sustained adoption and use of the fuel. The success of the Indonesian's intervention was achieved through different strategies including the provision of a free LPG starter package (e.g. a 3kg filled cylinder, one-burner stove, a rubber hose and a regulator) to resource-poor households; establishment of infrastructure to ensure adequate and safe supply of LPG; identification of local refill stations; education on the cost, safe use and benefits of LPG; and ensuring that the subsequent refill of LPG was affordable for the resource-poor households (Budya & Arofat, 2011 and Thoday et al., 2018).

Similar interventions to promote the use of LPG are reported elsewhere (e.g. da Silva, 2007; World Bank, 2014; Troncosco and da Silva, 2017). A study by Troncosco and da Silva (2017) shows that price is the single most important factor influencing the adoption of LPG as fuel for cooking in Latin America and the Caribbean, and that fuel subsidies seem to have helped the poor, particularly in Venezuela and Ecuador and urban poor in Bolivia, to transition from the use of biomass to LPG. In India, a scheme - "Pradhan Mantri Ujjwala Yojana" - was launched in 2016 to provide free clean cooking fuel solution to 50 million poor households by 2019. The scheme subsidised LPG connections for rural households by providing a free gas cylinder, regulator, and a connecting tube. After this, families had to buy their own refill cylinders. This led to a substantial increase in LPG ownership among rural households in the sample states. However, in contrast to the Indonesian scheme, many poor households in India are still using mainly solid fuels despite having LPG cylinders. Similar to Nigeria, several reasons, including the cost of refilling the LPG cylinder are responsible for the failure to sustain adoption of LPG in India (Yadavar, 2019 and Gupta et al., 2020). This implies that even if some households initially adopt low-carbon energy and energy efficiency practices, adoption may not be sustained, due to poor access and unaffordability (e.g. Clean Cooking Alliance, 2011). I discuss, in Chapters 4 and 5, the socio-economic constraints upon the implementation of renewable energy and energy-efficiency measures in Nigeria.

Understanding Socio-economic Constraints upon Forest Management Measures

In addition to the adoption of renewable energy and energy efficient practices, there is also the need to understand the socio-economic constraints of forest conservation practices and

implementation of forest management measures in relation to resource-poor people. Especially, in places where there may be issues of negative social safeguards including the marginalisation of the poor from forest resources, loss of livelihoods and land insecurities (e.g. Sunderlin et al., 2008; Agrawal et al., 2011; Peskett, 2011; Angelsen et al., 2012). This is especially so in some RDDCs, like Nigeria, where forests and forests resources are owned by the state, and where the narratives of lack of environmental awareness, placing the blame for deforestation on forest communities and their dependence on forest resources have often supported strict conservation projects that place harsh restrictions on use of forest by forest-dependent people (see Larson & Petkova, 2011; Angelsen et al., 2012; Makatala, 2016; Asiyanbi et al., 2017). I discuss, in Chapter 6, the socio-economic constraints upon the implementation of forest management in Nigeria.

As stated by Hussein et al. (2013), while the mitigation of GHG emissions is highly promoted in the interests of containing climate change globally, there is a continuous debate on the nature, content and impacts of the global mitigation policy actions on the welfare of poor people in developing countries. This includes, for instance, resource-poor people's access to energy and forests resources. For instance, whilst not dismissing that sustainable forest management is crucial to addressing climate change, scholars such as, Angelsen et al. (2012) argue that what some studies on forest conservation often show, is an overly simplistic assumptions about forest use and drivers of deforestation. These assumptions often promote a biased focus, followed by strict forest management interventions, on forest-dependent people. What this major focus on forest-dependent people clearly suggests, is similar to that echoed by Raworth (2017) in her economic development and sustainability study. According to Raworth, the idea of economic development has been sold at all costs, which has resulted in much pressure on the environment. However, even in trying to offer an alternative solution to economic growth and the environment, through sustainable development, there is a shortfall below, what Raworth termed, 'the ecologically safe and socially-just space for humanity'. That is, compromising basic human needs, livelihood sustenance and well-being in the interests of the reduction of global CO_2 emissions (to promote more global economic growth). At the same time, this approach marginalises poor people, and has consequential effects on the environment. In relation to forest management, Bensel (2008), amongst others, argues that some studies of deforestation fail to dissect the underlying drivers of deforestation in RDDCs. These drivers include socio-economic contexts of RDDCs (e.g. poverty, unemployment, poor

access to forest resources and lack of income). According to Angelsen and colleagues (2012), the biased focus on mostly forest-dependent communities may provoke negative social and economic impacts on rural forest-dependent communities. In turn, as argued by Godden and Tehan (2016) amongst others, the negative social impacts of forest management on forest-dependent people could promote threats to the success of forest management as forest-dependent people resist committing themselves to forest conservation.

In summation, it is important to note that without doubt, a better understanding of the main socio-economic factors that affect the implementation process, within the RDDCs country's socio-economic and the resource-poor contexts, could contribute to the success of its climate change mitigation policy goals. Developing a supportive policy framework can serve as one of the foundations to guide effective policy implementation (Mthethwa, 2012). This is important because a generalised theory cannot be applied to all countries because policymaking and implementation differ across countries, with the involvement of different actors, agencies, and within different contexts. Ajulor (2018) sees the trend among African nations to adopt foreign solutions in order to solve their problems as a bane of policy implementation, as such endeavours tend to fail to mobilise the local intellectual resources to utilise their knowledge to address the problems. This produces policy failure, as these restrictions also affect policymakers' views of the social and local environment in their pursuit of policy analysis. That said, it is important to note that, different actors have disparate views on what constitutes successful policy implementation (Bhuyan, 2010 and Mthethwa, 2012). McLaughlin (1987) and Cerna (2013) argued that it is difficult to pinpoint the exact factors or conditions that influence successful implementation, mainly because, as earlier mentioned, a lot of these factors depend on the political, economic, and social context. As such, focusing only on universal solutions and neglecting the particular context can result in disjointed implementation.

While a model for policy implementation does not necessarily mean that implementers can then adopt a simple process to implement policies (Spratt, 2009), uncovering and presenting the factors that influence implementation in a simple and context specific manner can create a better knowledge and understanding of the potential factors that influence climate change policy outcomes, especially in relation to low-carbon development in developing countries - the ultimate goal of this research. In regards to this study, it means not only focusing on the

institutional or socio-cultural constraints as have been reported in the broad literature on barriers to environmental / climate change policy implementation in Nigeria, but a method that encompasses the social and socio-economic contexts in relation to the Nigerian socio-economic reality, and serves to assist implementers in achieving low-carbon development in the country. With this in mind, I focus on the Contextual Interaction Theory, with examples of variables within the broader literature, to build a conceptual framework for this study as I investigate some of the factors that influence policy implementation. This general background study is used to locate the barriers to policy implementation as may relate to climate change policy implementation in Nigeria. A further analysis of the constraints upon climate mitigation policies implementation is then given in Chapters 4, 5 and 6.

PART TWO

Theoretical Framework

This section discusses the theoretical approach for this study. It starts with insights from the Contextual Interaction Theory to build a background understanding on the factors that affect policy implementation including, the resources, information, motivation, actors' interactions, and the poor understanding of local contexts in decision-making. This is followed by an overview of resistance to policy change, to build a background understanding of the potential constraints that may arise from the impacts of climate change mitigation policies, including the concerns surrounding economic growth, poor access to resources, threats of loss of income and livelihoods.

Understanding Policy Implementation: Insights from the Contextual Interaction Theory

Contextual Interaction Theory (CIT) is a deductive social process approach developed by Hans Bressers in the 1990s for environmental policies (De Boer & Bressers, 2011). Bressers used CIT as a policy implementation framework to postulate actor characteristics (resources, information, motivation), social interaction processes and the consideration of policy context as important factors to policy implementation (Bressers & De Boer, 2013).

CIT employs a broad consideration of multiple variables built on assumptions to explain the dynamics of social interaction processes, which include the policy tools (instruments) and the interactions between the implementers and target groups. One of the assumptions of CIT is that:

> The course and outcomes of the policy process depend not only on inputs (in this case, the characteristics of the policy instruments), but more crucially on the characteristics of the actors involved, particularly their motivation, information, and power (resources). All other factors that influence the process do so because, and in so far as, they influence the characteristics of the actors involved (Bressers and Kuks, 2003: 3).

In his work (e.g. Bressers, 2004), Bressers refers to actor characteristics, such as information, resources and motivation as the ultimate driving force of the implementation process. These core characteristics (resources, information, motivation) and interactions of policy actors shape policy implementation. I discuss some of these actor characteristics, issue of contexts, and actors interactions below.

Resources

Bressers (2004) refers to *Resources* as the capacity of an actor to act. He associates resources with Power which includes the access to money (also grants, subsidies and taxes), rights (e.g. land tenure, forest resources), information, as well as the availability of skilled personnel, technology, and time. Resource is considered an essential factor for policy implementation because it is a key indicator of the capacity to facilitate or impede policy objectives (De Boer & Bressers, 2011). In the context of forest conservation and energy reduction measures, for instance, this also implies that, regardless of policy intentions, the priorities of resource-dependent people will always take the centre stage. So, whilst forest-dependent actors may have the motivation to conserve forest, forest conservation measures could be impeded, due to poor access to alternative resources or lack of financial incentives. Similarly, as detailed in Part One, the adoption of renewable energy and energy-efficient technologies / practices by resource-poor people could be constrained by lack of resources including income and access to energy.

The lack of resources is a barrier to environmental policy implementation in African countries (see Oladipo, 2010; Hussaini, 2015; Okoh, 2015; Kalaba, 2016). Poor access to land and forest resources, low capacity of skilled workers, and poor funding are some of the barriers to the implementation of forest management in Nigeria (Caldecott & Morakinyo, 1996; Oyebo et al., 2010; Schoneveld, 2014) (Chapter 5 and 6). Similarly, the Federal Republic of Nigeria (2016[b]) and Department of Climate Change (2018) point out that some of the key challenges to the implementation of renewable energy and energy efficiency policies in Nigeria include weak institutional capacity, lack of technology and financial resources (Chapter 4). Building on the CIT framework, the conceptualisation and application of resources are used in this thesis to further explain the impact of lack of, or poor access to resources (e.g. forest resources, energy, land tenure) on the feasibility of, and consequently the compliance to, forest management and energy policy intervention in the RDDCs socio-economic context.

Information

In Bressers' perspective, information promotes the capacity and motivation to act on policy interventions. Information includes access of stakeholders to adequate and transparent information regarding a proposed policy and its decision-making process (also see Owens & Bressers, 2013 study on actors influence on policy implementation). This is important as actors can only make sense of social issues through the information available to them (also see Hajer, 1997). Adequate and transparent information include knowledge of the subject matter, the potential effects or associated risks of a policy intervention on people and the environment (Spratt, 2009 and De Boer & Bressers, 2011). For instance, in regards to forest management policy implementation in Nigeria, it is important that stakeholders, including forest-dependent people and communities have access to the information about the tradeoffs of the policy and in a publicly accessible language that they can understand. This includes how the proposed forest management interventions could affect their local economy and livelihood.

The conceptualisation of information for this thesis is to provide an insight on how much adequate information is available to the public to participate in the implementation of (e.g. energy reduction and forest management measures) in Nigeria. Husain (2014) and Ozor et al. (2015), identified the paucity of adequate information amongst the general public as a barrier to the enforcement of environmental measures in Nigeria. As noted in Part One, implementing

actors may fail to provide adequate or transparent information of the socio-economic risks of a forest management project to forest communities. Consequently, this act has promoted the poor commitment of target groups in forest management interventions (see Asiyanbi, 2016; Nuesiri, 2017; Akanni, 2018).

Motivation

Motivation of actors plays a very important role in the implementation process (Bressers, 2004 & Spratt, 2009). Motivation is often linked to will, commitment (McLaughlin, 1987), value and resources (Bressers, 2004 and De Boer & Bressers, 2011). The will to implement policies reflects how actors assess the value or appropriateness of a policy. This also signifies that low motivation for a policy program, due to poor access to resources, may result in the poor will to implement such a program. This may effectively turn policies into symbolic gestures without serious commitment in materialising it into reality (Bressers, 2004). Edoho & Dibie (2000) reported the failure in environmental policies to be directly linked to poor commitment to implement environmental protection in Africa. As reiterated in the case of Nigeria, poor policy commitment is associated with lack of resources for implementation (Oladipo, 2010; Hussaini, 2015; Okoh, 2015). Similar to the findings of the FAO & Federal Department of Forestry (2001) and UN-REDD (2012), Edoho & Dibie (2000) gave an example of how the commitment to implement environmental management policies including forest management policies is constrained by weak economy. This thesis investigates the impact of resources on stakeholders' motivations in the implementation of forest or energy measures, so as to provide insights on implementation failures.

An Understanding of Interactions and Context in Policy Implementation

CIT is based on the premise of a *context-specific* approach to policy implementation which means that 'policy instruments cannot be seen in isolation from the context (circumstances) in which they are applied' (Bresser, 2004 and De Boer & Bressers, 2013). This implies that the policy measures adopted must be considered holistically within the context of the place (including the situation of the target group), where the measures are to be implemented or enforced (Smith, 1973; Bressers, 2004; Bhuyan et al., 2010). Context, in this sense, include the social and economic circumstances of the people and place of the intended policy

intervention. In the Nigerian socio-economic context, this means that forest management interventions cannot be disconnected from the socio-economic realities of forest-dependent people and communities. In regards to low-carbon energy measures, this means taking considerations of the poor access to electricity that already affects the country, and the need for sustainable and affordable energy supply.

CIT also sees policy implementation as a multi-actor process (Bressers, 2004 and De Boer & Bressers, 2011). To analyse the constraints to implementation, it is imperative to consider both the interactions and non-interactions between actors (Bressers, 2004). There are different types of interaction in relation to the CIT approach: joint learning cooperation (active, passive or forced) and opposition.

Joint learning happens when actors lack information about a project, but then work together to find it. *Active cooperation* is observed when both parties share the same goal (the goal could be positive or negative) for the implementation of a project. *Passive cooperation* occurs when one or more actors take a relatively passive approach to implementation of the policy instrument. *Forced cooperation* refers to a type of passive cooperation which is imposed by a dominant actor (Bressers, 2004 and Owens & Bressers, 2013). However, forced cooperation is detrimental to policy implementation because even where, for instance, forced cooperation may be applied (e.g. the adoption of low-carbon energy and forest management measures), it can be argued that this type of cooperation may not be sustainable, and may provoke resistance to such policy goals in the long term.

Cooperation amongst actors is often a challenge in the policymaking and implementation processes in many contexts. This may be the case where the intended measures conflict with the local realities including the dependence on resources, where the measures are not feasible due to poor funding or poor access to resources such as energy, land, and forest resources, and / or where it impacts negatively on the resources of actors. Ekott (2016) and Asiyanbi et al. (2017) report poor cooperation amongst stakeholders in forest communities in Cross River State, Nigeria, where forest management measures negatively impacted on forest-dependent people's livelihood (See Chapter 6). As noted by Macintosh & Wilkinson (2015: 65), environmental policy making involves multiple actors, who are "subject to a variety of dynamic contextual, socio-economic and institutional factors that cooperate and compete in different

ways in order to achieve their procedural and substantive objectives." For instance, a forest management programme may be welcomed and adopted by the government, but may not necessarily be effectively enforced by forest officials, or realised by the target group (e.g. forest-dependent communities), due to social impacts and / or socio-economic factors (e.g. marginalisation from forest resources and negative impacts on livelihoods). For policy implementation to be successful, the active cooperation of multiple actors, including government, agency, or sector and target groups is required (Bressers, 2004). This is important for the implementation of forest management and energy measures, where the cooperation, involvement in policymaking and decision-making processes, and commitment of target group is critical because they play an active role in policy implementation, as such they cannot be passive recipients of publicly initiated efforts (O'Toole, 2000).

Bressers (2004) highlights that *opposition* occurs when one of the actors attempts to prevent other actors from acting in the implementation of a policy or programs, and this would always lead to conflict in the process. Opposition could also imply failure of the stakeholders' engagement process in policy making and implementation, due to poor communication of information or failed disclosure of the effects of the policy intervention. This failure can also affect the level of motivation, leading to the poor acceptability, and consequent lack of feasibility of the policy. Opposition could arise, for instance, due to the perceived loss of access to resources, threats to income or livelihood, and / or the poor consideration of the local contexts including the target groups social and economic situation. This is why CIT draws attention to a context-specific approach in the implementation of environmental policies. For instance, whilst the implementation of an environmental measure may work in a particular region due to environmental awareness, the same may not be so in another without the resources (e.g. energy, finance) to effect the change.

In summary, this thesis employs CIT to investigate factors that may influence climate change mitigation policy implementation within the RDDCs socio-economic context and how these factors interact with each other. A context-specific approach is adopted to understand the holistic consideration of local context socio-economic factors and its influence on target communities' commitment to pro-environmental practices and the extent to which they commit to the implementation of environmental policies. The concept of resources in this thesis is used to understand how the lack of resources, poor access to resources and/ or the threats of loss of

resources including, employment and income, may affect the implementation of low-carbon energy and forest management policies in Nigeria. Information is used in this thesis to provide an understanding on the importance of transparency and accessibility of information to, for instance, the public, or impacted actors to build participation in the policymaking and implementation processes. Motivation is used generally to understand how resources and information, and the consideration of social safeguards may shape actors' will to implement or commit to the implementation of climate change policy measures.

Nevertheless, it is important to note that CIT has also been criticised for being too narrow about the factors that influence policy implementation (Owens, 2013 and Owens & Bressers, 2013). As pointed out by Scharpf (1997), theories that are excessively focused on a few factors tend to "ignore" either actors or institutions over the other in such arguments. However, Owens (2013) argues that addressing all factors within any research agenda is infeasible and impractical, as it may fail to address the most important factors as may apply in a given case. That said, CIT has developed over the years, with the openness that it can be further developed in other ways or cases (Owens, 2013). As such, I have adopted the CIT framework with the view that, while it provides useful insights to build on the factors that affect environmental policy implementation in general, it is not sufficiently applied within the RDDC's socio-economic and policy implementation challenges contexts, as it has been developed and mainly applied to environmental policy implementation issues in the developed countries' context. Thus, building on the CIT framework, I also focus on resistance to policy change to further develop an analytical framework through which the socio-economic constraints upon climate change mitigation policies, in regards to the Nigeria's socio-economic context, can be explained.

Understanding Acceptability, Feasibility and Resistance to Policy Change

An important aspect of this thesis is to understand how resources can promote the feasibility, acceptability of, or resistance to the implementation of low-carbon energy and forest management policies and / or interventions. While Andrews-Speed (2016) argues that the level of commitment or support for low-carbon energy policies by institutional or policy actors is highly dependent on the government or political regime, other scholars (e.g. McLaughlin,

1987; Bressers, 2004; Brynard, 2009; De Boer & Bressers, 2011) argue that commitment or the will to accept, implement or participate to realise policy implementation is also dependent on access to resources. Resistance may occur due to the feasibility constraints of a policy. Feasibility, in this instance, is a function of economic profile and how the policy is perceived by different actors, including the government and impacted interests (e.g. forests-dependent people and citizens with poor access to energy), to affect their economy, income and livelihood. For example, as detailed in Part One, an environmental policy may not be feasible, due to the low economic capacity of a country and consideration of the real cost of the intervention on economic growth. As such, the government may not fully commit to the implementation of an environmental policy (Macintosh & Wilkinson, 2015). A form of resistance to policy that is focused on in this thesis is the poor access to resources and the poor consideration of social safeguards on impacted actors. For example, if a forest management intervention may cause forest-dependent people and communities to suffer poor access to forest resources and lose their livelihoods, it is possible that they may not support or commit to the implementation of forest conservation or may sabotage ongoing efforts to protect the forests.

As noted by Meadowcroft (2009) and Kanter (2012), resistance to change is an inevitable feature of policy interventions and societal transformation. Resistance to policy could happen due to different factors, which include uncertainty, lack of trust, threats of loss of income, past resentments. It often manifests itself in different ways, including reluctance or deliberate delay to adopt or implement policy, petty sabotage or direct rebellions. Policy resistance can be related to Bressers' discussions of actors' characteristics (resources, information, motivation), social interaction processes such as cooperation and opposition, and the considerations of local context in policy implementation. As highlighted by Bressers (2004), actors' characteristics, interactions of policy actors and local context influence implementation of environmental policies. In other words, these factors have implications for the actors' responses to policy implementation. This includes the acceptance, commitment or resistance of actors to the implementation of climate change mitigation policies. For instance, the poor cooperation and opposition of actors to policy implementation can be exhibited due to the poor consideration of their local socio-economic situations including poor access to resources, land insecurity, and / or loss of income from the intended policy.

As earlier explained with the CIT framework, the successful implementation of environmental policies requires the active cooperation and participation of actors including target groups (O'Toole, 2000 and Bressers, 2004). The need for local support in the implementation of forest management has been identified in the literature as critical (e.g. O'Toole, 2000; Garekae, et al., 2016; Garnett et al., 2018) as otherwise may mean resistance to conservation by local communities. However, Brockington (2004) cautions the claim that local support is important for conservation because it can be imposed on local communities by powerful interests including state authority and other powerful actors. Focused on power, inequality and injustice in community conservation, Brockington's study maintained that, while marginalised people may resist conservation, conservation can be achieved through power[15] because local people may be ill-equipped to win such resistance.

Still, it is also important to understand that resistance should also not be viewed as "a youthful aspiration to social change that could never be realised" (Wright (2016: 3). Resistance may be perpetuated in varied ways and as revealed in James Scott's (1985) work, *Weapons of the Weak*, which follows studies on poor smallholders, resistance does not always take the form of violent uprising, political or social movements. This means that whilst it may not necessarily be conducted as coordinated social movements or obvious forms of resistance, which may include violence, resistance may still lead to sabotage of forest conservation or interventions. As argued by Scott, resistance could be exhibited in a 'cold' or 'hidden' way, but at the same time wreak damage upon public infrastructure or the environment. Scott, for instance, gave examples of actions of disguised compliance with rich landowners, by poor villagers in Malaysia, who expressed their resentments over acts of inequality and domination against them, through low-key sabotage and private communications to promote resistance. Similarly, it could be argued that poor forest-dependent people may silently decide to ignore forest degradation or management, if faced with continuous marginalisation or limited access to resources.

Moreover, while powerful interests can wield power to promote forest conservation, it is noteworthy to understand that, as observed by Atkinson (2003: 105) "....power always

[15] Power here can also be seen as forced cooperation as expressed by Bressers (2004) (see earlier section on 'actors interactions' and types of cooperation).

engenders resistance, and domination is only ever partial". This view could be argued in the case of forest conservation in RDDCs, including Nigeria, where issues of marginalisation and access to forest resources have promoted poor implementation and deforestation. This is not a surprise because as agreed by Brockington (2004: 415), "oppression now will just store up trouble for the future". In other words, while power or forced cooperation may be used to implement forest management, it is questionable that the conservation measure will be sustained in the long term, due to resistance by marginalised forest-dependent people. Acts of resistance, for instance, could be non-violent, by displaying nonchalant attitude or poor response to forest conservation, or even to acts of deforestation by others, even if they cannot directly fight back power. Or, as reflected in the CIT framework, marginalised target actors may take a passive stance to the implementation of the policy, which although may not hinder the project, but may also not stimulate it to succeed (Owens & Bressers, 2013). Subtle forms of resentment have been linked to non-chalant attitude to forest conservation. For example, Schoneveld (2014) reports resentment among forest communities, following the loss of forest resources and promised compensation after a failed forest conservation project in Oban, Cross River State, Nigeria. Forest communities in the State have also been reported to increasingly collude with illegal loggers and showed no interest in forest conservation, after they were deprived their royalties from forest revenues by the government, who appropriated the royalties to themselves (Caldecott & Morakinyo, 1996 and Schoneveld, 2014).

In sum, power or a strict management approach alone may not be sufficient to conserve forest in the long term in Nigeria. As aforementioned, there remains a gap on the understanding of resistance as a socio-economic constraint upon climate change mitigation policy in RDDCs, with reference to Nigeria. This includes how the conflicting objectives of socio-economic factors (e.g. access to energy, employment, sustaining economic growth, and the eradication of poverty and hunger) and environmental protection, and the threats to these factors for resource-dependent people, may pose resistance and constraints to climate change mitigation policies. Building on this chapter's conceptual and theoretical framework, I now proceed to propose a Context-Specific Socio-Economic Constraints Framework as an analytical framework to provide insights on the socio-economic constraints upon the implementation of climate change mitigation policies in Nigeria.

PART THREE

Analytical Framework

Context-specific Socio-economic Constraints Framework

The integration of a robust consideration of socio-economic constraints in the implementation of climate change mitigation policies and analysis is important in the RDDCs socio-economic context. This Context-Specific Socio-Economic Constraints Framework (Figure 2.1) proposes five factors (Resources, Motivation, Acceptability, Feasibility, and Resistance) that can potentially influence policy implementation outcomes, to provide an understanding of the socio-economic constraints upon the implementation of climate change mitigation policies in the context of RDDCs, with a focus on access to resources[16]. I have chosen Resources and Motivation as the factors that promote actors' response to policy interventions. Acceptability, Feasibility, and Resistance are used here to reflect actors' reactions to policy interventions in the absence of resources. These factors are selected as resource-dependent factors in relation to the socio-economic context of RDDCs because as evidenced in the literature, resource is linked to the motivation, acceptability, feasibility, and resistance to policy implementation. Below, I outline the components of the analytical framework.

Socio-economic Context and Constraint Space

The 'Socio-economic Context and Constraint Space' is set in this thesis as the space, which may influence the response to climate change mitigation policy implementation in the RDDCs' context. The Socio-economic Context is the space that determines (motivates) the acceptability or resistance, which impacts on the feasibility of the implementation of climate change mitigation policies. It controls the entirety of the policy response, but is directly connected to Resources, the key factor, which influences the motivation for acceptability or resistance to the implementation of climate change mitigation policies in the RDDCs' context.

Resources

Resource in this framework is to understand how access to resources, poor consideration of social safeguards, lack of adequate and accessible information, and lack of participation of stakeholders (e.g. affected communities) in decision-making may shape the implementation of

[16] Resources here include natural resources, information, income, finance and subsidies.

environmental policies in the RDDCs socio-economic context. Resources also include information. In addition to natural and financial resources, *Information* in this framework is identified as a key resource that shapes the implementation of environmental policies. Information in this context include access to adequate, accessible and transparent information, produced in a publicly accessible language, about environmental issues and measures, as well as the purpose and tradeoffs of the policy and interventions.

Motivation

This framework presents *Motivation* as a factor to understand the influence of resources on policy implementation. In other words, how access to resources including energy, forests, land, threats of loss of income and livelihoods, adequate information about the policy intervention, and / or stakeholders' participation in decision-making may affect the will of actors to implement or resist energy and forest management measures. The framework proposes that the motivation or will to support the implementation of such policies in RDDCs' socio-economic context is dependent on the practical considerations of access to resources, threats of loss of income and livelihood, adequate information about the policy intervention, and stakeholders' participation in decision-making.

Acceptability

Acceptability is presented as a reactive factor in this framework to provide an understanding on the acceptability of climate change mitigation policies within the RDDCs' socio-economic and resource-dependence contexts. It is a product of sufficient motivation that could arise from access to resources including energy, forests, land and adequate information about the policy intervention, and the overall success of the stakeholder's engagement and participation processes leading up to implementation.

Acceptability is also a product of the practical assessment / consideration of the impacts of the policy intervention on the target group, in view of their socio-economic context including their dependence on resources, income, land tenure rights, access to resources, forest benefits / payments. Acceptability is also a product of the effective communication of relevant information of impacts, success of the engagement processes. The focus here is to explore the influence (or not) of access to resources on the acceptability of climate change mitigation measures within the RDDCs context.

Feasibility

This framework presents *feasibility* as a reactive factor to provide an understanding on how access to resources, including broad acceptance of policy objectives through effective communication of information regarding the impacts of policy and the safeguard measures to manage such impacts, may shape policy implementation. These impacts may include the potential threats of loss of income, access to, or lack of access, to resources. Feasibility is a product of resource availability and policy acceptability. The focus here also is that, if sufficient motivation exists for policy acceptability, feasibility is promoted. Conversely, resistance to policy implementation will result in infeasibility.

Resistance

Resistance is set as a reactive factor, in this analytical framework, to build an understanding of how the lack of access to resources, threats of loss of income, land tenure insecurity, diversion / capture of forest benefit payments, lack of communication of relevant information of impacts, failure of the engagement processes and poor consideration of these factors may influence the resistance to the implementation of climate change mitigation policies. Here, resistance should also be understood as a by-product of negative motivation resulting from failure of the engagement processes to address the impacts of policy interventions and following the poor consideration of the loss of income, lack of access to resources. Resistance is perceived in this study as a socio-economic constraint, as it may promote poor or negative response to climate change mitigation policy interventions.

The proposed analytical framework is utilised in Chapters 4, 5 and 6 to further address research questions 2 and 3:

1. What are the main socio-economic factors that affect Nigeria's implementation of climate change mitigation policies?

The connection of the analytical framework with this question (research question 2) is on the aspect of the influence of Resources on the implementation of energy and forest management measures in a resource-dependent context, and how Resources promote actors' Motivation to participate and realise such policy interventions.

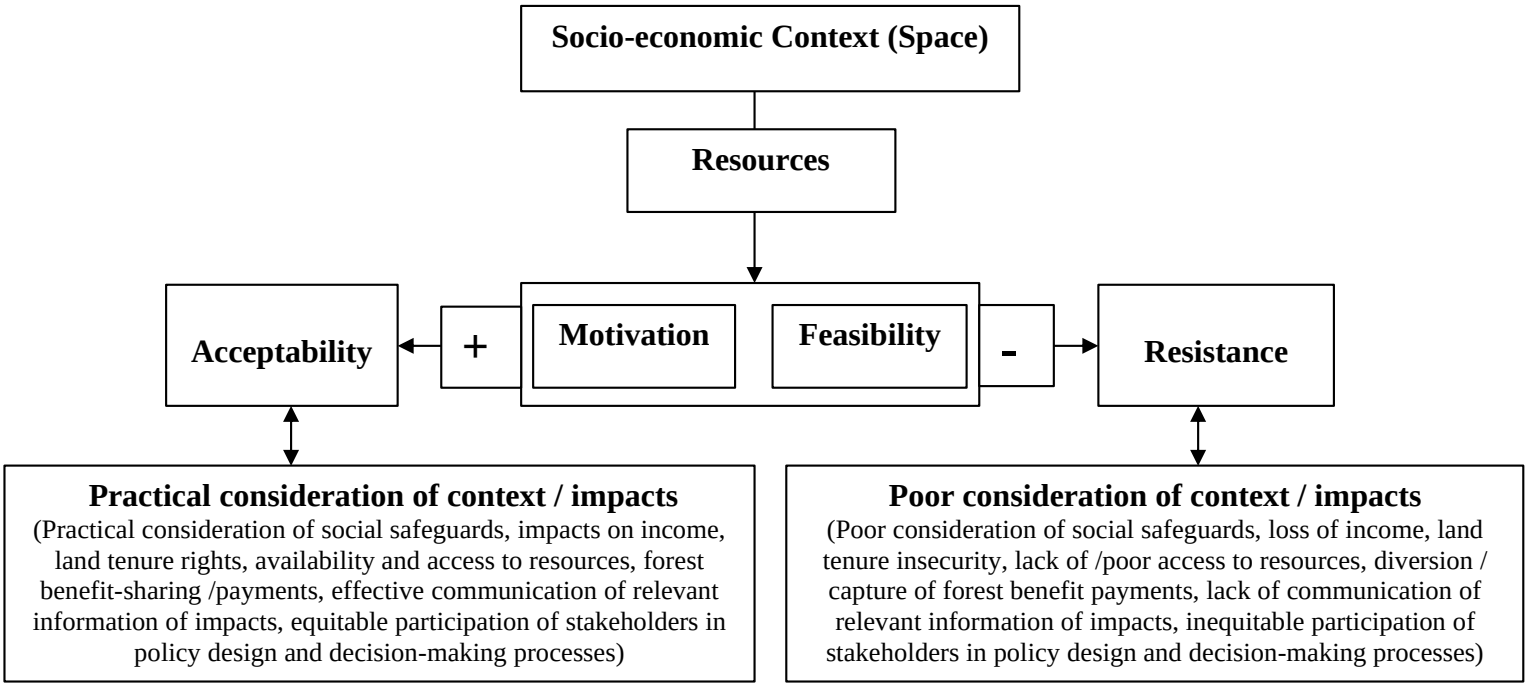
2. How do these socio-economic factors pose constraints upon the implementation of Nigeria's climate change mitigation policies?

The analytical framework connects with the above question (research question 3) in building an insight on how the outcome of the availability of resources (Feasibility), practical consideration of resources, social safeguards, and participation of target communities in policymaking and decision-making (Acceptability) could promote Motivation for the implementation of energy and forest management policies; and the constraints upon implementation, due to Resistance that may arise from the lack of resources and the poor consideration of resources, social safeguards, and participation of target communities in policymaking and decision-making.

Chapter Summary and Conclusion

Building on discussions and debates in existing literature, this chapter identifies how socio-economic factors, including access to resources (e.g. energy, forests, land tenure rights, finance, information), inclusion of target groups in policy design and decision-making, and practical consideration of social safeguards may either increase motivation for or how their absence may pose resistance to policy outcomes in the RDDCs' context. In turn, this thesis posits that environmental policies are conflicted with socio-economic needs, and that the availability of resources, engagement of target groups in policy design and decision-making processes, and consideration of social safeguards are prerequisites for the implementation of climate change mitigation policies in Nigeria. Neglecting the socio-economic dimensions in the climate change mitigation policy process may promote resistance to such climate change mitigation interventions and inhibit the successful implementation of such policies, especially in relation to low-carbon energy and forest management.

Figure 2.1: A Context-Specific Socio-economic Constraints Framework.



Source: Author's compilation (2021).

CHAPTER 3

Research Methodology

Introduction

This study utilised a qualitative case study approach to examine the policy challenges in context. "A case study research is an empirical inquiry that investigates a contemporary phenomenon in depth and within its real-life context....." (Yin, 2009: 18). A case study approach also allows the researcher to conduct in-depth investigations of issues, which may relate to a policy, strategy, phenomenon, or individuals through different sources of data (Stake, 1995). A case study approach was appropriate for this research as the purpose was to use the case of Nigeria to examine how the implementation climate change mitigation policies is unfolding.

When conducting case study research, it is important that the cases are carefully selected for them to either produce similar results (literal replication), or contrasting results, however, for predictable reasons (theoretical replication). If the cases selected support the same theory, replication can be claimed. A greater level of replication of the cases studied show the extent of rigour with which a theory has been established (Rowley, 2002). This approach was selected for this research because it allowed me to use low carbon energy, and the REDD+ forest management programme in Cross River State (CRS), Nigeria to provide insights into the socio-economic constraints upon the implementation of climate change mitigation, in relation to RDDCs socio-economic context. Building on Rowley's work, the selection of the two sectors (energy and forest management) was important in order to provide a generalisation of the case study to enable it contribute to existing theory, as well as the rigour by which the conceptual framework is established.

In line with the case study approach, this research employs a mixed qualitative method in addressing the research questions. In the first part of the chapter, I discussed the research design and a description of the secondary and primary data collection approaches, including the desk study reviews, semi-structured interviews, qualitative survey questionnaires, and participant

observation adopted for the study. This is followed by the identification and selection of research participants, and the discussion of the data analysis, interpretation and writing. A discussion of research quality issues, ethical issues, and challenges of data collection, including the approaches I adopted to address these issues will then follow.

Research Design and Data Collection Methods

This study is concerned with exploring the constraints upon the implementation of climate change mitigation policy in Nigeria. As such, I have chosen qualitative analysis for this research. Qualitative analysis according to Hancock et al. (2009) and Jamshed (2014) is an exploratory form of study, which focuses on the subjective world, helps to gain an understanding of the social aspects of the world, and provides the opportunity to unveil trends in thoughts and opinions, creating room for a further in-depth study into the problem being explored.

The secondary data collection for this study consists of desk study of grey and published literature and policy reviews selected through a web search and journal database including Scopus, Google Scholar, Elsevier, for publications between 2005 and 2015, and a review of reference lists of relevant literature. For instance, to answer research question 1: "To what extent are the climate change mitigation policies being implemented in Nigeria?", I first undertook a review of Nigeria's climate change mitigation policies and relevant documents, covering the period 2010 to 2018, including its National Climate Change Policy Response and Strategy (NCCPRS), Nationally Determined Contributions (NDC). In addition, I reviewed nine other low-carbon energy and forest management policies: the National Renewable Energy and Energy Efficiency Policy (NREEEP), Renewable Energy Master Plan (REMP), Sustainable Energy for All (SE4ALL) Nigeria Initiative, First Biennial Update Report (BUR1) of the Federal Republic of Nigeria, National Forest Policy, Nigeria REDD+ Readiness Programme Document, REDD+ Readiness Preparation Proposal (R-PP), Cross River State Forestry Commission Law, Cross River State REDD+ Strategy (see Appendix 7). These policies were particularly reviewed because of their relevance to the research questions and policy evaluation. Details of these policies are provided in Chapters 4, 5 and 6. Based on the

review, I was able to explore further the extent to which the objectives set in these policies have been or are being implemented.

During the fieldwork, relevant documents related to environmental and climate policies were also sourced from government, NGOs, research centres and other educational institutions' archives including that of the Federal Ministry of Environment, Climate Change Department, CISME, Centre for 21st Century Issues, and Heinrich Boll Stiftung. Acquiring these relevant documents from these direct sources was important, as they were not readily available online. These documents supported in providing further insights on the implementation of climate mitigation policies, including low carbon energy and forest management measures to date in Nigeria. However, they do not independently answer any of the research questions.

Further to the desk study, fieldwork was carried out from June to September 2016 in Nigeria. This was followed with a supplementary data collection from January to March, and August to September, 2019 (through phone, emails and in person).

The primary data collection for this study includes semi-structured interviews, qualitative survey questionnaires, and participant observation. As stated by Gill et al. (2008), qualitative interviews are the most appropriate in cases where much is not known about the study, where detailed insights into the study are required from individual participants, or for exploring sensitive topics where participants may be prone to conceal details of an enquiry in a group setting. Semi-structured interviews create the opportunity for the researcher or respondent to digress in order to probe an idea or response further. As this study seeks to gain in-depth understanding of the socio-economic constraints upon the implementation of climate change mitigation policies, the method of semi-structured interviews was chosen. The semi-structured interview was particularly useful for the in-depth study, as it helped in engaging with the participants and encouraged them to discuss the topic further. This helped open up new findings, which further helped to establish the constraints upon climate change mitigation policy implementation in Nigeria. The semi-structured interview was used to address research questions 1, 2 and 3. Research question 2 and 3 were also addressed through the Analytical Framework, I designed in Chapter 2.

Prior to the interview process, an Information Sheet and Consent Form were given to participants to ensure they were happy to participate in the interview (Appendix 1 and 2). The interview questions were constructed as predefined lists of questions (See Appendix 4), which were used as guides to prompt and remind me of the questions to ask and areas to probe on. The main topics covered were the 3 research questions (See Chapter 1). I also included a few simple questions relating to the visibility of climate change, climate change awareness, and the mitigation actions taken by the government and the public. These questions were added as simple questions to get the interviewees relaxed and engaged in the process. However, this discussion was done briefly, and I quickly moved on to the main interview questions. Although, some of the main research questions were included in the survey questionnaires, during the interview, I intentionally asked them again, but phrased in different ways from those used in the survey questionnaires. This approach was to probe further to get quality answers and reduce biases, as well as compare notes for validity of findings.

During the interviewing sections, it was sometimes difficult to strictly follow the predefined list of questions and areas to probe because new findings instigated further discussion and other probing into the topic being discussed. Nevertheless, I tried to bring the discussion within the limit of the predefined questions and to manage the scheduled time. This was important, so as not to offend or bore interviewees, or distract myself from the main topic being investigated. The interviews were designed to last for 60 minutes, but the times varied in the field as the interviews were conducted between 45 to 90 minutes. Where interviews exceeded the allotted time, I apologised to the interviewees, and asked whether they were happy to continue the interview, which invariably they were.

The qualitative survey questionnaires were designed to complement the semi-structured interviews, and thus had some similar questions relating to the extent of climate change mitigation policy implementation and factors that affect climate change mitigation policy implementation. As such, they were designed as qualitative surveys with both close-ended and open-ended questions to help participants explain further on the issues. Although this approach was also utilised as a back-up plan, in case participants were not available to attend the face-to-face interview, the main research questions were further explored during the face-to-face interview, as these questions needed in-depth investigation and probing.

Identification and Selection of Study Participants

I conducted semi-structured face-to-face interviews with actors from public sector (government agencies and academic institutions), grassroots organisations (non-governmental organisations-NGOs) and private sector operators, who showed interest in the study and were willing to give in-depth information in response to the research questions. These participants were also selected because being part of the policy/decision-making, negotiation and environmental advocacy processes in Nigeria, they are in the best position to provide useful information on climate change policy implementation issues and elucidate the reasons for the challenges in Nigeria. Given that this study mainly focuses on the resource-poor population, it would have been useful to interview the resource-poor or forest-dependent communities to give an account of the socio-economic constraints and ascertain how they are affected by policy implementation. However, it was not practically feasible to conduct this study on this group, due to various constraints including issues of accessibility, time, and the resources of a PhD research. Nevertheless, this study was able to reduce this limitation by engaging and interviewing actors from grassroots organisations and representatives of forest communities during the Participant Observation. These actors provided useful information on the subject, as they have vast understanding and knowledge of the social and economic issues through their work with people in various communities. I provide a full list of the interviewees in Appendix 3. In total, I conducted 57 interviews after which I was convinced that data saturation was reached (Burmeister and Aitken, 2012). Data saturation is used in qualitative research to reduce data redundancy. In this case, the data collection process is stopped once the researcher can determine that additional interviews are yielding no new or additional information that is relevant for the study (Seidman, 2006 and Fusch & Ness, 2015). Of the 57 interviews conducted, 28 respondents covered the issues of energy and environmental policy implementation in general, 11 respondents covered forest management issues and 18 provided information on both sectors.

In selecting the research participants, I adopted the snowballing and purposive sampling techniques (Miles and Huberman, 1994). Prior to the fieldwork, I spent some time as a Research Fellow at the research institute, the Centre for Investment, Sustainable Development, Management and Environment (CISME) in Nigeria. This connection helped in facilitating the process of reaching an initial 12 participants, prior to my fieldwork trip to Nigeria. Following

this process, I was able to build rapport with these initial participants from the public sector (government agencies and academic institutions), civil society organisations (non-governmental and community-based organisations) and private sector, who helped in connecting me to some other eligible participants. Upon reaching Nigeria, I was able to reach more eligible participants through the initial 12 participants. I also had the opportunity to attend two environmental events, hosted by the Nigerian Environmental Society, where I was able to increase my contact base.

In addition to the semi-structured interview, the qualitative survey questionnaires, were initially sent out to the selected participants to complete before the semi-structured interview, in case they were not available to attend the face-to-face interview. However, after they had received the questionnaire, participants were encouraged to have a face-to-face interview, in order to gain an in-depth knowledge about the issues of climate change policy implementation. Amongst the 57 participants interviewed, 42 completed the questionnaires before the interview, while the others only participated in the face-to-face interview. In these latter cases, this resulted in a longer duration over the targeted scheduled interview time because I had to ensure that some of the questions in the questionnaire were addressed during the interview by these 15 interviewees.

Furthermore, I conducted participant observation at a United Nations Climate Change conference. This approach was particularly useful for research questions 2 and 3. This method was employed because, as stated by Hammersley & Atkinson (1995) and Giddens & Sutton (2013), it is useful for gaining an in-depth understanding of social process, by means of observing people, communities, group or organisations, through participation in their activities. It can provide information about the people, communities, group or organisations studied, and how they understand themselves. To collect data for this study, I participated as a researcher and an environmental activist[17] in different negotiations and workshops at a UN Climate Change Conference in Marrakech, Morocco, in 2016. (The UN Climate Change Conference is a yearly programme held in the framework of the UNFCCC. It is a formal meeting to discuss and assess the progress of climate change response by countries.)

[17] Engaging in various environmental advocacy activities including raising environmental awareness through seminars and social media, and organising environmental sanitation projects and events with environmental volunteers.

I carried out the observation for 1 week as a member of a Civil Society Organisation (CSO) group, Global Gender and Climate Alliance (GGCA) under the cover of a grassroots organisation in Nigeria (Centre for 21st Century Issues) to advocate for indigenous forest people and rural women's role in climate change response and decision-making. However, my key aim was to understand in general the socio-economic challenges of developing countries in implementing climate change mitigation policies, with a focus on Nigeria, through the discussions of policy makers and other delegates who attended the conference from Nigeria.

In both roles, as a researcher and as an environmental activist, I observed key actors from government agencies, research and academic institutions, policy makers, world leaders and their representatives, grassroots organisations, indigenous people, and women representatives from rural communities in Nigeria and other developing countries. The observation was done during workshops and plenary sessions as the different actors discussed climate change mitigation policies, including the plans, actions, progress and barriers to implementation as well as the factors that may inhibit forest-dependent and rural people's responses to policies designed to mitigate climate change.

I also participated in advocacy activities through talks and presentations, and activists' climate march across designated areas to campaign for increased climate actions, which takes consideration of forest-dependent people and rural women in climate change decision-making. The participant observation gave me an insight into some barriers to the implementation of low-carbon policies, including conflicting objectives, socio-economic impacts of policy interventions on forest-dependent people, and the poor participation of rural people in climate change decision-making in Nigeria.

Data analysis, interpretation and writing

Following the fieldwork, the interviews were transcribed and organised in order to identify key themes from the data, by adopting Boyatzis (1998) and Ritchie et al. (2003) 'Thematic Framework' approach of qualitative data analysis. After familiarising myself with the data to get a good understanding of the patterns and key issues from the field data, the data was

manually coded twice in line with the research questions in Chapter 1, and analytical framework in Chapter 2. Following the first round of coding, related codes were grouped together to condense the amount of data initially coded. Examples of the codes include: resource-dependence, poor participation of local people in decision-making, resistance, motivation, access to resources, affordability, feasibility and motivation, threats to loss of income, policy inconsistency, impacts of low-carbon energy, impacts of forest management, and impacts on livelihoods. Finally, after the second round of data collection, I built on the previous findings from the first round of fieldwork and regrouped the codes (motivation, access to resources, acceptability, affordability, feasibility, and resistance) related to the conceptual framework. This process of coding was useful for re-organising and categorising the data into themes. The key themes that emerged and quotations from the data were used to write and interpret the analysis chapters.

Building on the suggestion of Crang (2003), the writing of the analysis chapters involved a back-and-forth process, which includes rechecking the full transcripts in order to gain a better understanding of the original contexts of the information from interviewees.

Validity and Reliability

Validity of data refers to the extent to which an account accurately represents the social phenomena to which it refers (Hammersley, 1990: 57), and this is crucial to the quality of research findings (Hammersley, 1992 and Golafshani, 2003). For data validity during the fieldwork, I ensured that I gained my interviewees' trust, and I also made sure that the questions were better communicated to them. This was important, especially as I perceived that some of the government interviewees may see the enquiry as sensitive or controversial to their organisation. For instance, government officials may think they were being blamed for poor climate change mitigation policies and some interviewees may fear that disclosing certain information or views, such as the weak political will by the government to implement low carbon policies could affect their career. As such, to reduce such concerns, I reassured interviewees that data anonymity was strictly considered in this study. See the section on 'Ethical considerations' for more details.

Moreover, during the interview, I assured interviewees that my intention was only to conduct an academic research exercise in order to understand the constraints upon the implementation of climate change mitigation policies, in order to help Nigeria respond better to climate change. Therefore, the results will be used only for academic purposes and all responses will be reported anonymously, with the identity of interviewees disguised, both in the thesis and papers published in the public domain.

Furthermore, I adopted the suggestion of Hammersley (1992), that the validity of research findings is weighed by presenting more adequate evidence to support them. Hence, to improve my data analysis, first, I triangulated the findings from my interviews, questionnaires and participant observation data to compare the similar responses and whether they corroborated one another. In this case, similar responses given in the interviews and noted in the survey questionnaires and participant observation were used to establish the validity of the field findings.

Secondly, to improve the validity of the research, I used mostly academic literature, in addition to media publications, national government and technical reports on low-carbon energy and forest management policy implementation in Nigeria to support my evidence. The use of academic literature was important for this purpose because it is considered relatively reliable because it has passed through a peer review process. Moreover, to ensure validity of the secondary data, I also critically analysed their content with the empirical data obtained from my primary sources. This process was particularly important because I was aware of the potential bias that may be associated with secondary data (Flowerdew & Martin, 2005).

To improve the reliability of the data, I endeavoured to avoid asking leading questions during the data collection process (Hammersley 1992; Golafshani 2003; Seidman, 2006). For the data analysis, high reliability requires that the research findings be reported "as concrete as possible, including verbatim accounts of what people say…, rather than researchers' reconstructions of the general sense of what a person said, which would allow researchers' personal perspectives to influence the reporting" (Seale, 1999: 148). As such, audio recording was used during the interviews, so as to capture interviewees' views accurately.

Ethical Considerations

I proceeded with data collection, after securing ethical approval from the University of Kent. Before starting the interviews, I introduced myself to interviewees and reminded them of the Information Sheet and Consent Form (Appendix 1 and 2), which were emailed to them, to ensure that they understood that their participation was voluntary, that they had the right not to respond to any question, and that they could terminate the interview at any time without consequences. More importantly, as mentioned in the previous section, I informed interviewees that the information collected from this study will only be used for the purpose of my research. They were informed that data will be anonymised and the recording of the interviews will be kept on a password-protected computer. The data will be destroyed 6 months after the completion of the thesis and the study participants will be informed of this. All interviews were conducted with written consent.

Summary

This chapter has provided the methodology employed in the collection and analysis of data in this research. This chapter has also provided reasons for choosing the study method, study units and participants' groups. The benefits of the field study and approaches employed have also been provided. The research adopts a mixed qualitative approach, such as semi-structured interviews, survey questionnaires and participants observation. Both primary and secondary data, including national government, media publications and technical reports on low-carbon energy and forest management policy implementation in Nigeria, have been collected as sources of evidence for this study. This chapter also shows that data quality and ethical issues have been taken into consideration. In Chapters 4, 5 and 6, I present the findings to answer the research questions.

CHAPTER 4

Resource and Motivation in Low-Carbon Energy and Energy Efficiency Deployment: An Evaluation of Climate Change Mitigation Policy

"Management decisions are not worth the paper they are written on unless the policies and decisions are implemented" (Elliot, 1997).

Introduction

This chapter focuses on the energy sector as a case study to address the second research question: To what extent is climate change mitigation policy being implemented in Nigeria? It also partly addresses research question two: What are the socio-economic constraints upon climate change mitigation? The chapter is divided into two parts. In seeking to understand the extent of implementation of the low-carbon energy and energy efficiency policies, it was useful to first present a background knowledge of energy-related emission and mitigation policies in Nigeria. Thus, Part One is a review on energy activities and emissions in relation to power generation activities in the residential sector. The extensive search methodology conducted on Scopus, Google Scholar and Elsevier for publications between 2005 and 2015 was useful here as the relevant texts in the policies relating to the progress of implementation were identified using key terms including: solar energy, energy efficiency, off-grid systems, modern electricity, renewable energy, energy capacity, incandescent bulb, rural communities, energy access, fossil fuels, generators and LPG. Following the policy review is a discussion on Nigeria's emission reduction agenda for energy activities, and the climate change mitigation and low-carbon energy policies to date. Part Two is an evaluation of the implementation of the climate change mitigation and energy policies, with reference to access to energy and the low-carbon energy capacity between 2012 and 2018. Here, I apply the conceptual framework outlined in Chapter 2 to examine the influence of resources on the implementation of low-carbon energy and energy efficiency policies by investigating the progress on the deployment of low-carbon energy and energy efficiency technologies.

PART ONE

Energy Activities and Emissions in Nigeria

Compliance with the goal of reducing GHG emissions principally requires accelerating global access to low-carbon energy and energy efficiency by 2030 as set out in the Sustainable Energy for All (SE4ALL) Initiative[18], and the 2050 timeline specified in the Paris Agreement. Although RDDCs are targeting the global goal to reduce GHG emissions, they are, however, challenged by access to energy and its resultant effect on meeting the Sustainable Development Goal 7 (SDG 7) - which aims to, amongst other things, achieve access to affordable, reliable, sustainable and modern energy for all by 2030.

In the African region, particularly SSA, energy poverty resulting from poor electricity generation is the main challenge, given that over 600 million people lack access to clean and affordable energy and 790 million people depend on biomass fuel as energy source for cooking and heating their homes (Avila et al., 2017 and Morrissey, 2017). Although SSA is endowed with vast resources, installed capacity and grid presence is not a guarantee for access to electricity. Even with a high potential (11,000 GW) of energy generation, its installed capacity estimates are very low resulting in energy scarcity and an average per capita consumption of 488 kilowatt hour (kWh) a year, which is one of the lowest in the world. The poor energy access unquestionably worsens energy-related emissions in the region due to the prolific growth in the use of inefficient energy including PHFFGs and fuelwood. The causes of the scarcity are owing various issues including the lack of generation capacity for grid-connected regions, inadequate grid infrastructure to deliver generated power, poor maintenance of generation plants, and the dispersal of population in rural or remote areas. Consequently, the entire installed generation capacity of the region (excluding South Africa), is estimated at 28 GW, with 13 GW located in Nigeria. Of the 13 GW, only about 6 GW is operational owing to Nigeria's peculiarities of poor maintenance and fuel shortages (Avila et al., 2017).

[18] SE4ALL was launched in 2011 to address global access to clean, reliable and affordable energy by 2030. https://www.seforall.org/about-us

Nigeria's energy consumption and generation challenge is highly representative of SSA given that its per capita energy consumption is very low - 30 watts per person (See International Finance Corporation, 2019). Although it has a high rate of grid connection, the country has a low quality of electricity supply. Like other countries in the region, Nigeria, as mentioned in Chapter 1, has abundant renewable and fossil energy resources, however, these resources are not yet developed to meet its electricity demand. As such the country currently depends more on the use of fossil fuel[19] to meet its energy demand, which is the greatest, similar to South Africa, in SSA (Avila et al., 2017).

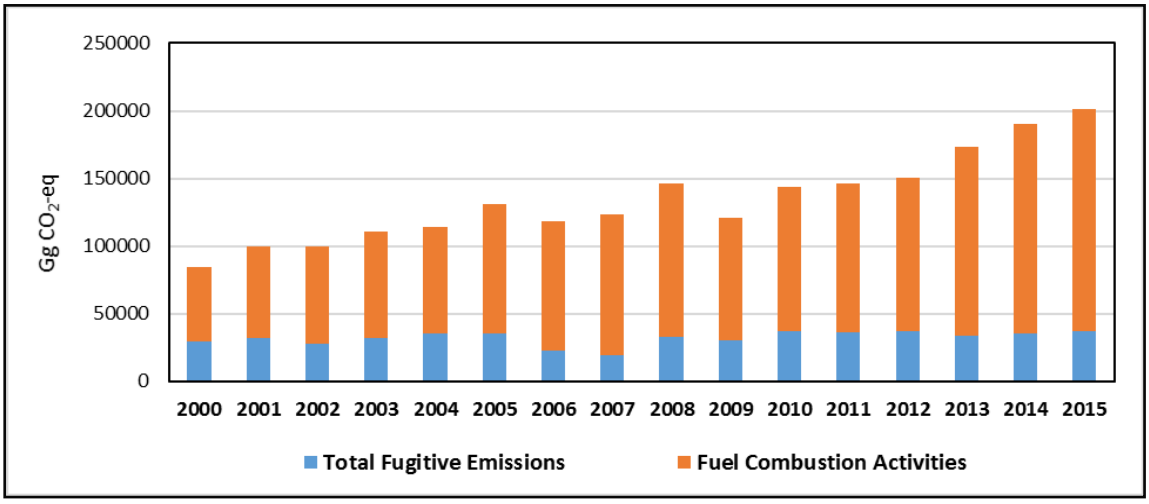
Nigeria is a typical example of such RDDCs faced with the challenges of poor access to clean energy and the resultant increasing GHG emissions from fuel combustion activities. As a SDG 7 Energy Progress Report 2019 by the World Bank and four other custodian agencies[20] confirms, Nigeria remains one of the top 20 electricity access-deficit countries (IEA et al., 2019). This energy deficit gives rise to other challenges, including the increasing use of PHFFGs and fuelwood, which result in increasing GHG emissions (Department of Climate Change, 2018).

As mentioned in Chapter 1, Nigeria is fast becoming a significant contributor to GHG emissions (Achike & Onoja, 2014). In 2015, Nigeria's net GHG emissions amounted to 712,638 Gg CO_2-eq, of which energy accounted for the second leading source of GHG emissions (201320 Gg CO_2-eq / 28.2%), after agriculture, forestry, and other land-use (AFOLU). AFOLU accounted for 476949 Gg CO_2-eq (66.9%). In the energy sector, total emissions increased from 84,815 Gg CO2-eq in 2000 to 201,320 Gg CO2-eq in 2015. The reason for the increase in emissions in the energy sector is mainly due to fuel combustion, including power supply, and fugitive emissions (e.g. gas flaring activities) (Figure 4.1). Of which, fuel combustion contributed 81.5%, and 18.5% was from fugitive processes (Department of Climate Change, 2018). This thesis focuses on fuel combustion in relation to energy activities in the residential sector.

[19] More than 70 per cent of SSA's energy generation is from fossil fuel, while hydropower accounts for about 20 per cent.

[20] International Energy Agency (IEA), the International Renewable Energy Agency (IRENA, the United Nations Statistics Division (UNSD) and the World Health Organization (WHO).
https://sustainabledevelopment.un.org/content/documents/2019_Tracking_SDG7_Report.pdf

Figure 4.1: Energy Sector GHG emission trends (2000-2015).



Source: Department of Climate Change (2018).

Fuel combustion activities are related to the energy industries, transport, manufacturing industries and construction, and other sectors. Of the GHG emissions from fuel combustion activities (201,320 Gg CO2-eq) in 2015, the Energy Industries contributed the bulk (55991 Gg CO2-eq), followed by Other Sectors (48315 Gg CO2-eq) (Table 4.1), which is mostly from electricity generation and consumption activities. Of these, the residential sector is a major contributor (Department of Climate Change, 2018).

Table 4.1: GHG emissions from Fuel combustion activities sectors in 2015.

Sector	**Energy Industries**	**Other Sectors**
Emission (Gg CO2-eq)	55991	48315
Emission (%)	34.1	29.5

Source: Department of Climate Change (2018). Adapted

In the Energy Industries, electricity generation and consumption are major contributors to GHG emissions in Nigeria. For example, of the total GHG emissions (55991.22 Gg CO2-eq) from the Energy Industries, electricity generation contributed a significant proportion (45186.76 Gg CO2-eq), compared to activities from other sectors such as the Manufacture of Solid Fuels and

Other Energy Industries (10283.90 Gg CO2-eq) and Petroleum Refining (520.55 Gg CO2-eq) (Table 4.2) (Department of Climate Change, 2018).

Table 4.2: GHG emissions from Energy Industries activities in 2015.

Sector	**Electricity Generation**	**Manufacture of Solid Fuels and Other Energy Industries**	**Petroleum Refining**
Emission (Gg CO2-eq)	45186.76	10283.90	520.55
Emission (%)	80.7	18.4	0.9

Source: Authors compilation adapted from the Department of Climate Change (2018).

Similarly, of the 48315.4 Gg CO2-eq GHG emissions by the Other Sectors category, energy activities in the Residential sector accounted for 45745.23 Gg CO2-eq (Table 4.3) (Department of Climate Change, 2018). This indicates that energy activities from the residential sector are major contributors of GHG emissions in Nigeria.

Table 4.3: GHG emissions from Other Sectors and Residential sector activities in 2015.

Sector	**Residential**
Emission (Gg CO2-eq)	45745.23
Emission (%)	94.7

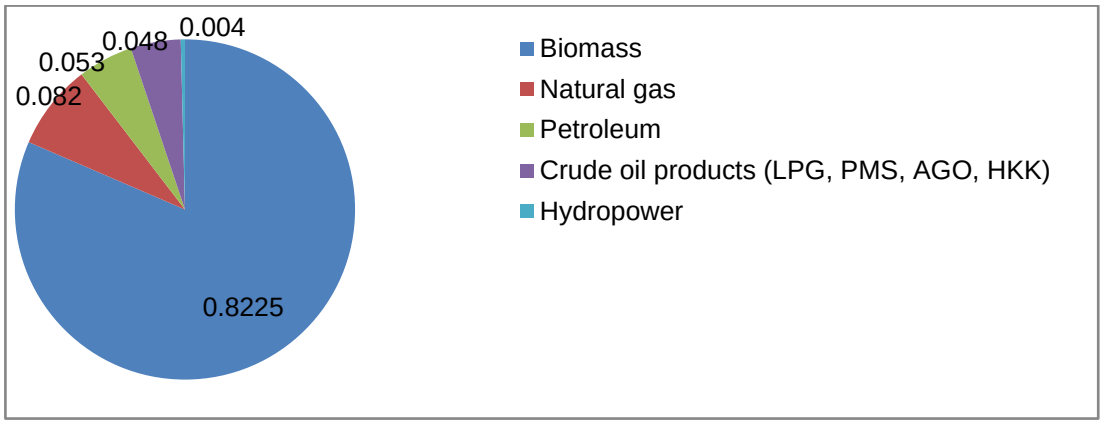
Source: Authors compilation adapted from the Department of Climate Change (2018).

Electricity Generation

GHG emissions from the residential sector have continued to grow in recent years. This is particularly reflected in the increase in CO_2 emissions from the use of biomass for energy in the residential sector between 2000 (354345 Gg CO_2) and 2015 (583464 Gg CO_2). The increase in GHG emissions from the residential sector is mainly from electricity activities relating to the use of natural gas, residual fuel oil (RFO), diesel fuel (automobile gas oil) and

biomass fuel. As shown in Figure 4.2, the major[21] energy fuels in Nigeria are biomass (82.25%), natural gas (8.2%), petroleum (5.3%) and crude oil products (4.8%) (e.g. liquified petroleum gas (LPG), petrol (PMS), diesel (AGO) and household kerosene (HHK) (Table 4.4). Energy from hydropower contributes a small percentage (0.4%) of the energy used in Nigeria, due to its low installed capacity. In 2016, hydropower (from three major hydropower plants) accounted for 25 per cent of its electricity generation, compared to 75 per cent of the total net generation of the country's electricity, mainly from gas fired power plant (Department of Climate Change, 2018).

Figure 4.2: Energy fuels contribution in Nigeria.



Source: Authors compilation adapted from the Department of Climate Change (2018).

Natural gas, including diesel and RFO as back-up fuels, is used for public power generation. Fuels consumed in the residential sector include gasoline and diesel fuel for electricity generation, HKK for cooking and lighting, and LPG and biomass fuels (fuelwood and charcoal) for cooking and heating (Department of Climate Change, 2018).

The increased use of biomass and petroleum products is due to the poor access to affordable and adequate supply of electricity. As earlier mentioned, Nigeria has one of the lowest rates of net electricity generation per capita globally (Chete et al., 2016 and IEA et al., 2019). Compared to the global average of 900 watts per person, Nigeria's installed electricity capacity is about 30 watts per person (International Finance Corporation, 2019). Currently (2018), nearly 60 per cent of Nigeria's population lacks access to sustainable energy supply (IEA, 2014

[21] A limited contributions from non-hydropower renewable sources makes up the rest of Nigeria's electricity generation (Department of Climate Change, 2018).

and Department of Climate Change, 2018) (Table 4.5). A 2015 record showed that 72 per cent of the population connected to the grid are in the urban area and 28 per cent are in the rural area. Overall, about half of the population with access to the grid are faced with poor quality of electricity supply. As lamented by interviewees:

> The power shortage in the country is very serious and challenging both for individuals and businesses. We are talking about development, yet we cannot power businesses, which bring development. (Interviewee 3, Min. of Environment, South East)

> The situation is really bad at the moment. It is almost like we don't have electricity without the use of power generators anymore. The talk for improvement on electricity has been for years and we can hardly believe that a country like Nigeria is still going through darkness in this time and age. (Interviewee 25, NGO, South West)

Similar responses were also provided by participants of the open-ended survey.

> The power supply is very poor. In urban areas, those who can afford converter get it. But this is not the case for everyone. Many people now use generators. This is causing more pollution. Firewood is a norm in rural areas. Even in urban areas, people are using firewood. The power supply in the rural there is worse than the urban areas. (Survey Participant / Interviewee 2, Min. of Environment, South East)

While, Nigeria has 12.5 gigawatts (GW) of installed generation capacity, only an average of 4 GW is currently available for transmission to end users as over 7 per cent is lost in transmission, and over 27 per cent load is rejected at distribution, due to technical, commercial and collection issues (Department of Climate Change, 2018; ThisDay Newspaper, 2019; Adeyanju et al., 2020). Although, between 1970 and 2012, Nigeria's annual electricity consumption increased from 1,273 to 29,573 Gigawatt hours (GWh) (Energy Commission of Nigeria, 2014), the available generating capacity dropped considerably over the years, particularly from 1990, below the required capacity for electricity demand (GIZ, 2015 and Chete et al., 2016). The low capacity in the total annual generation is due to diverse factors, which include natural gas supply constraints, grid constraints, poor maintenance, low funding and investment in the power sector, inadequate electricity infrastructure and other technical constraints (GIZ, 2019). For instance, although, Nigeria is one of the world's leading exporters of crude oil, it imports about 85 per cent of its refined petroleum products, due to lack of domestic refining capacity (Federal Ministry of Power, 2016). This places a constraint on

power generation because, as aforementioned, 75 per cent of the total net generation of Nigeria's electricity, is from gas-fired power plant. This means that, any gas supply shortages will inevitably have negative impact on its electricity generation (Department of Climate Change, 2018).

Table 4.4: Fuel consumption in the residential sector ('000 mt).

Year	PMS	HHK	AGO	LPG	Wood/ Wood waste	Charcoal	Vegetal waste
2000	444.04	865.23	3.29	10.05	87393.75	1026.00	1571622.00
2001	666.16	1617.78	3.41	11.02	89618.25	1156.00	1611758.00
2002	810.24	151.69	3.58	18.38	91908.75	1289.00	1653083.00
2003	813.82	1087.39	3.41	17.21	94273.50	1462.00	1695738.00
2004	765.24	1106.82	2.45	23.70	96726.00	1596.00	1739890.00
2005	806.20	1101.30	3.03	6.30	99277.50	1785.00	1785653.00
2006	774.74	734.65	189.35	10.45	101929.50	1989.00	1833066.00
2007	826.30	424.34	158.96	2.81	104683.50	2800.00	1882116.00
2008	886.05	776.56	174.18	5.69	107543.25	2558.00	1932804.00
2009	886.53	559.60	129.75	14.66	110511.00	2191.00	1985129.00
2010	592.56	530.17	100.93	11.21	113589.00	2525.00	2039078.00
2011	530.53	714.28	112.24	14.44	116778.75	2893.00	2094664.00
2012	467.96	500.36	77.67	7.00	120079.50	3320.00	2151823.00
2013	1482.39	2112.30	324.90	9.01	123346.50	3106.00	2210364.00
2014	1622.75	2287.17	369.48	11.61	126671.25	3190.00	2269954.00
2015	1482.39	2112.30	324.90	15.64	130724.73	3292.08	2331242.76

Source: Authors compilation adapted from the Department of Climate Change (2018).

In addition to the insufficient gas constraints, Nigeria's poor electricity generation is worsened by its poor power infrastructure, which has steadily deteriorated over the years. Similar to existing literature (e.g. Sambo, 2008), interviewees and survey participants confirmed that the primary reason for the deterioration in the power sector is the low investment in new power plants coupled with poor maintenance of existing plants in the two decades leading to 1999.

> The epileptic power supply and distribution has been an age long issue affecting the country and caused an increase in the use of artificial power supply of generators. Nigeria until most recently has relied mainly on dam electricity power generation, which has become derelict. (Interviewee 21, NGO, South West)
>
> In my area, we have not had proper electricity supply for 2 days now. So many issues are involved, we produce crude oil but don't have adequate refining facilities for natural gas supply, there are issues of poorly managed facilities … many of the infrastrucre have deteriorated. We need to address the issue of maintenance of infrastructure and invest in the country's power sector. (Survey Participant / Interviewee 11, NGO, South East)

> There have been several promises and funding to improve on the country's energy supply, but these have been met with failures in many occasions due to lack of finance required to meet this demand. (Survey Participant / Interviewee 33, University Lecturer, South South)

As at 2016, Nigeria had hydropower potential of about 12,620 MW, of which only about 1,930 MW had been developed at Kainji, Jebba and Shiroro dams (Department of Climate Change, 2018). The existing power plants are a mix of plants built before the 1990s and those built or being constructed since the mid-1990s, and hence the inadequate power facilities and poor capacity for electricity generation, resulting in power outages of several hours daily (GIZ, 2015).

Consequently, there is an increase in the use of PHFFGs and fuelwood. For instance, over 80 per cent of Nigeria's population still rely on traditional biomass as their source of energy (IEA, 2016 and Department of Climate Change, 2018). More than 50 million metric tons of fuelwood is consumed yearly. This is more prevalent in the rural areas (Federal Ministry of Power, 2016 and National Bureau of Statistics, 2016). A household survey by the Nigerian National Bureau of Statistics (2016) showed that between 2015 and 2016, 49.6 per cent of households who are connected to an electrical grid also used firewood and charcoal for cooking when electricity is unavailable. The breakdown of the figure between rural and urban population is 75.7% and 31.4% respectively (Figure 4.3). The increasing use of fuelwood is contributing to the rate of GHG emissions from fuel combustion activities in the residential sector. While, in 2000 CO_2 emissions from this activity was estimated to be 354345 Gg CO_2, in 2015 total CO_2 emissions was estimated at 583464 Gg CO_2 (Department of Climate Change, 2018)[22]. The increased use

[22] The transformation of fuel wood to charcoal in energy industries also contributed to the estimated total CO_2 emissions of 583464 Gg CO_2 in 2015.

of fuelwood is also reported to be contributing to deforestation in the country (Federal Ministry of Environment, 2015 and EIA, 2016).

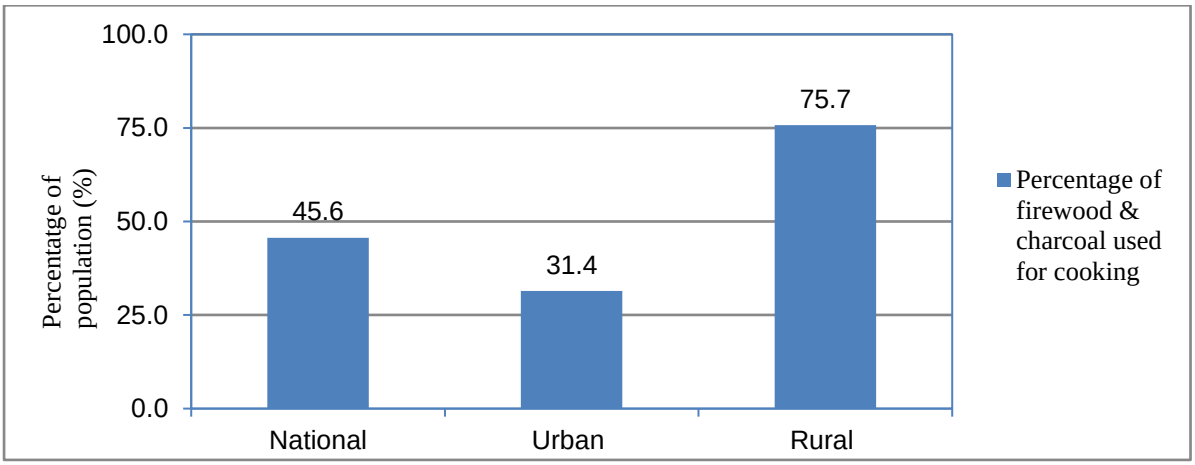
Table 4.5. Proportion of the population with access to electricity between 2000 and 2018.

Electricity Access In Nigeria					Urban	Rural
2000	2005	2010	2015	2018	2018	2018
43%	47%	48%	53%	60%	86%	34%

Source: World Bank (2019), adapted

Nigeria's poor energy supply has also resulted in an increased use of portable household fossil fuel generators (PHFFGs) in the residential sector. Although, there remains a data gap on the actual number of PHFFGs in Nigeria, the total capacity of the installed PHFFGs in both the residential sector is estimated to be over 50 per cent of the installed capacity of the national electricity grid (Energy Commission of Nigeria, 2014). Approximately, 12 billion dollars is spent by Nigerians annually on buying and operating PHFFGs (Dalberg, 2019). The high cost of self-generation has an adverse impact on the country's economy, its attractiveness to foreign investors, and growth of local businesses (EIA, 2016 and Federal Ministry of Power, 2017), the consequence of which has been a rapid decline in the number of small-scale and labour-intensive industries (World Bank, 2014[b]).

Figure 4.3: Percentage of firewood and charcoal used for cooking during blackout, 2015-2016.



Source: Authors compilation from the National Bureau of Statistics (2016).

In addition to the negative economic impact on the residential sector, PHFFGs are also linked to the contribution of GHG emissions in Nigeria (EIA, 2016). The level of emissions varies with the different sizes of PHFFGs. Large (>375kW) emits 699 g/kWh, medium (>75kW to <375) is 883 g/kWh, and small (<75kW) is 1580 g/kWh) (Moss & Gleave, 2014). Small PHFFGs (0-4 kVA) are the most common in Nigeria. However, uncertainty exists about their exact number. A rough estimate of 22 and 60 million PHFFGs s in the residential sector have been given in different studies (Dalberg, 2019). A 2010 study by the World Bank on diesel power generation and black carbon emissions, gave an estimate of 0.2 kilotonnes for annual black carbon from the use of PHFFGs by the residential sector alone. An estimate of about 2 kilotonnes was generated from the telecommunications, oil and gas and manufacturing industries alone (World Bank, 2014[b]).

Following the huge shortage of electricity supply across the country, the government has resolved to address the energy deficit (Department of Climate Change, 2018). The government plans involved the restructuring and privatisation of the power sector in 2013, and the development of policies and infrastructure to increase energy supply and reduce energy emissions (GIZ, 2016). For instance, the draft revised National Energy Policy of 2013 was developed to provide the framework for clean, affordable, adequate and reliable energy to the country. Other policies and initiatives to address energy-related emissions are discussed in the subsequent section.

Nigeria's Emission Reduction Agenda for Energy Activities

The Nigerian government recognises the importance of reducing its energy emissions so as to address the threats of climate change to the country (Federal Republic of Nigeria, 2016). Being a signatory to the UNFCCC Kyoto Protocol, part of Nigeria's international climate change commitments is to promote low-carbon development within the context of poverty reduction and economic growth. In essence, Nigeria intends to pursue its development priorities in a sustainable manner and in turn contribute to the global fight against climate change (Department of Climate Change, 2018). Based on this commitment, Nigeria has adopted some climate change mitigation policies and initiatives.

Below, I present some of the energy policies and initiatives adopted by Nigeria to drive its National Climate Change Policy Response and Strategy and NDC goals. The reviewed policies are then evaluated in Part Two, together with the conceptual framework outlined in Chapter 2, to examine the influence of resources and the socio-economic constraints upon the development and deployment of low-carbon energy and energy efficiency policies. The same is further applied in Chapter 5, to evaluate the socio-economic constraints upon the implementation of the energy policy goals, with regards to acceptance (sustained adoption) of low-carbon energy and energy efficiency technologies by resource-poor people.

As mentioned in Chapter 1, Nigeria adopted the **National Climate Change Policy Response and Strategy (NCCPRS)** in 2012. NCCPRS is a climate change mitigation policy to promote low-carbon and high growth economic development path, while building a climate-resilient society. In line with its climate change mitigation policy, part of Nigeria's goal is to reduce energy-related emissions by increasing access to energy and promoting low-carbon energy and energy efficiency in the residential sector. Figure 4.4 highlights the objectives of the NCCPRS policy (AfDB, 2013; Nachmany et al., 2014; Federal Ministry of Environment, 2015).

Figure 4.4: The NCCPRS objectives.

- **Implement mitigation measures that will promote low carbon as well as sustainable and high economic growth;**
- **Enhance national capacity to adapt to climate change;**
- **Raise climate change related science, technology and R&D to a new level that will enable the country to better participate in international scientific and technological cooperation on climate change;**
- **Significantly increase public awareness and involve private sector participation in addressing the challenges of climate change;**
- **Strengthen national institutions and mechanisms (policy, legislative and economic) to establish a suitable and functional framework for climate change governance.**

Adapted from (Federal Ministry of Environment, 2015).

Further to the NCCPRS, Nigeria, through its NDC communicated its determination to contribute to global target to reduce GHG emissions below 2^{o}C (Federal Ministry of Environment, 2015). The targets outlined in its NDC to address residential energy emissions include to:

1. Provide 13 GW off-grid solar photo voltaic (PV) energy to rural communities that are currently not connected to the national grid;
2. Improve electricity grid, provide energy access to all Nigerians, and significantly reduce the use of small fossil fuel (petrol and diesel) generators;
3. Achieve a 2 per cent energy efficiency annually (30 per cent by 2030);
4. Promote the use of efficient gas generators.

Upon the full implementation of Nigeria's NDC by 2030, it is estimated that 338 million tonnes of GHG emissions would be reduced from the energy sector (Federal Ministry of Environment, 2015). Table 4.6 outlines the potential emissions that may be reduced in the energy sector.

To achieve its mitigation goals, Nigeria's NDC has both conditional and unconditional targets (Federal Ministry of Environment, 2015). Whereas, a "conditional" target (contribution) would be undertaken by a country, if international means of support are provided, or other conditions are met, an “unconditional” contribution is that which a country could implement based on their own resources and capabilities, and without any conditions (Taibi & Konrad, 2018). With its conditional target, Nigeria aims to reduce its emissions by 47 per cent by 2030 below business as usual (BAU), providing it receives needed support in the forms of finance and investment, technology, and capacity building (Federal Ministry of Environment, 2021). Nigeria's unconditional target is to reduce its GHG emissions from the energy sector by 20 per cent below BAU levels by 2030, without a reversal effect on its economic development. Under this target, following an annual economic growth target of 5 per cent, it is estimated that Nigeria will be able to keep emissions at the 2015 rate of 2 tonnes CO_2 eq per capita in 2030. Failure of which may result in an increase in emissions of up to 3 tonnes CO_2 eq per capita (Federal Ministry of Environment, 2015).

Table 4.6: Estimated emission reduction by the energy sector.

Measures	**Potential GHG reduction (million tonnes per year in 2030)**
Economy-wide energy efficiency	179
Efficient gas power stations	102

Reduce transmission losses	26
Renewable energy	31

Source: Federal Ministry of Environment (2015).

In furtherance of its low-carbon energy goals, Nigeria has developed various (overlapping) energy policies and initiatives over the years. However, only a few of the drafted policies have been approved and enforced to date (Federal Ministry of Power, 2016). Some of its energy policies, with a focus on low-carbon energy and energy efficiency include: the Renewable Energy Master Plan (REMP) 2012 (updated), National Energy Policy 2013 (updated), SE4ALL (2012) Nigeria Initiative, and the National Renewable Energy and Energy Efficiency Policy (NREEEP), 2015. However, only the SE4ALL initiative and NREEP have been approved (Department of Climate Change, 2018).

In its pursuit of safe, reliable and affordable energy to for its citizens, Nigeria launched the **SE4ALL Nigeria Initiative** in 2012. The SE4ALL Initiative, an international organisation, is working with countries to pursue faster actions that will help achieve SDG 7 for universal access to sustainable energy by 2030, and the Paris Agreement, to reduce GHG emissions in order to get global warming to below 2° Celsius. To achieve these goals by 2030, the global objectives are to: (1) Achieve universal energy access, (2) Double the global rate of improvement in energy efficiency; and (3) Double the share of renewable energy in the global energy mix. In line with the SE4All initiative, Nigeria seeks to achieve 30 per cent of renewable energy contribution to on-grid generation capacity by 2030, by increasing access to modern electricity, utilise renewable energy and energy efficiency. To this end, electricity supply will come from on-grid, off-grid and self-generation (Federal Ministry of Power, 2016): To achieve this goal, Nigeria set targets to:

- Increase access to modern electricity to a total capacity of 23.5 GW and 45 GW in 2020, 2030 respectively;

- Increase Nigeria's on-grid renewable energy capacity to 5,300 MW and 13,800 MW (including large hydro power) in 2020 and 2030 respectively, and 2,700 MW and 9,100 MW of on-grid renewable energy (excluding large hydro power) in 2020 and

2030 respectively. This means an increase in on-grid supply from 26 per cent in 2016 to 48 per cent and 70 per cent in 2020 and 2030 respectively.

- Increase the overall supply from off-grid systems (mini-grid and solar home systems) to 3 per cent and 12 per cent in 2020 and 2030 respectively;

- Increase the use of modern cooking fuels such as electricity, liquefied petroleum gas (LPG), kerosene, biogas and solar cookers to reach 50 per cent of the population by 2020 and 80 per cent by 2030, from the estimated 10 per cent in 2012. The other 20 per cent households will have access to improved wood cooks stove and efficient charcoal production for cooking;

- Reduce the use of self-generated power from the 74 per cent level in 2012 to about 49 per cent and 18 per cent in 2020 and 2030 respectively.

The National Renewable Energy and Energy Efficiency Policy (NREEEP) was approved by the Federal Executive Council in 2015 to address Nigeria's energy supply targets in a sustainable way. The NREEP framework builds on the goals of the SE4ALL initiative to address the country's challenge of access to modern and clean energy resources, improved energy security and climate change objectives. The policy seeks to achieve a renewable electricity target of 20 per cent 2030 by increasingly utilising hydropower, biomass, solar, wind, geothermal, wave and tidal energy power plants, and cogeneration plants for energy production. This will be achieved through the increased development, operation and maintenance, and upgrading of new and existing energy generation facilities (Ministry of Power, 2015). The key objectives of the policy relating to residential energy emissions reduction targets include to:

- Increase the contribution of solar energy to the total energy mix and ensure a minimum electricity contribution of 3 per cent by 2020 and 6 per cent by 2030;

- Replace 40 per cent of its old and inefficient appliances with energy efficient appliances by 2020 and 2030;

- Replace all incandescent bulbs with light emitting diodes (LEDs) and other energy saving bulbs by 2025

Similar to other SSA's Nigeria is committed to meeting the long-term goals of the Paris Agreement through its NDC and other climate change policy goals. However, as earlier mentioned, the achievement of its low carbon development goals may be constrained by poor access to the financial and technological resources. This challenge seems to be a general issue in the implementation of climate change goals in Africa. For example, while Kenya has an ambitious goal to abate GHG emissions by 30 per cent by 2030 relative to the BAU scenario of 143 million tonnes of CO_2 equivalent, the achievement of this goal, similar to Nigeria, is subject to international support including finance, investment, technology development and transfer (Government of Kenya, 2018).

Although, African countries are making some progress in accessing climate finance, accessed funds are not yet commensurate to their climate change mitigation needs. For instance, climate finance flows from several actors including Multilateral Development Banks, international climate funds such as the Global Environment Facility, the Climate Investment Funds and the Green Climate Fund, the private sector and African countries to SSA on average for 2015 and 2016 was US$ 12 billion for mitigation and adaption. However, current levels of climate finance are insufficient to meet the region's climate mitigation finance needs (AfDB, 2018) as the annual cost for adaptation to climate change alone is estimated to be at least $18 billion between 2010 and 2050 (Nakhooda et al., 2011). I discuss in more details, the constraints upon the implementation of Nigeria low carbon energy goals, in Part Two and Chapter 5.

As highlighted earlier in the NDC and the NCCPRS sections, low-carbon energy and energy efficiency are key objective of Nigeria's NDC and the NCCPRS. The purpose of the NREEP is thus to drive the low-carbon energy and energy efficiency targets of the NCCPRS and NDC (Ministry of Power, 2015). Whilst, the main focus of this thesis is on the implementation of low-carbon energy and energy efficiency, reference is also made to poor access to energy and energy goals in general because part of Nigeria's commitment to reducing its energy-related GHG emissions is to address the poor access to energy.

The above summary of Nigeria's emission reduction agenda provides the evidence that Nigeria has developed relevant policies to pursue its commitment to address energy emissions. It is imperative to note that, due to the dearth of effective information gathering, storage and retrieval system, not all the planned, ongoing and executed projects have been satisfactorily documented, a failure largely attributable to poor centralised systems for collating, analysing and reporting data on mitigation (Department of Climate Change, 2018 Nigeria). The limitations of the information system have been factored into this thesis. As a result of this apparent limitation in data, this chapter's analysis rests largely on available information in form of energy policy goals and expressed objectives on the climate change mitigation and energy policies between 2012 and 2015. To this end, the progress made to date on the deployment of low-carbon energy and energy efficiency technologies, and the influence of resources on their implementation is explored, in Part Two, using the conceptual framework outlined in Chapter 2. The evaluation is focused on the electrification rates (access to energy) (national, urban and rural) and energy capacity between 2012 and 2018, using 2010 (before the climate change mitigation and low-carbon energy policies were adopted) as a baseline.

PART TWO

Evaluating the Progress on the Implementation of Energy Policies

This case study on the extent that energy policies are being implemented in Nigeria provides an understanding of the influence of resources on Nigeria's goals to address poor access to energy and scale-up low-carbon energy and energy efficiency measures. In summary, the findings on the extent to which energy policies are being implemented and the influence of resource on the policies implementation show that:

- Between 2012 and 2018, some progress was recorded on the low-carbon energy, energy efficiency and rural electrification (off-grid electricity) projects. There are also various planned, implemented and ongoing low-carbon energy and rural electrification, improved cook stoves, street lightening and hydropower refurbishment projects. Worthy of note is the fact that the scope of implementation is insufficient to address the country's growing electricity demand, low-carbon energy and energy efficiency goals by 2030. For instance, although, there was an increase in the installed and available capacity between 2012 and 2018, the annual

average electricity generation remained at an average of 4 GW (Table 4.7) and insufficient to meet the electricity demand, which was over 14 GW as at 2016 (GIZ, 2016).

- The under-performance in rate of implementation is accounted for by poor resources (e.g. financial and technological resources). This indicates, as highlighted in the conceptual framework, the indisputable importance of resources in the effective implementation of low-carbon energy and energy efficiency policies.

- Without much effort to address the resource constraint, Nigeria's climate change mitigation goal to reduce energy-related GHG emissions from the residential sector by 2030 may be in jeopardy.

The Resource Feasibility Constraint: Low-carbon Energy Deployment

In this section, I examine the progress toward the NDC goal: *to improve electricity grid, provide energy access to all Nigerians, and significantly reduce the use of small fossil fuel (petrol and diesel) generators;* and the SE4ALL goal: *to increase access to modern electricity to a total capacity of 45 GW in 2030.* I also examine the feasibility constraint upon implementation of these energy goals. In view of the energy initiatives and policy goals to increase access to energy, low-carbon energy and energy efficiency by 2030, it is evident that Nigeria is making progress, albeit slow, to implement its low-carbon energy and energy efficiency policies. Evidence abounds that shows that the extent to which the energy policies are being implemented is currently not sufficient to meet Nigeria's energy demand and climate change commitment to reduce energy-related GHG emissions by 2030. As shown in Table 4.7, access to electricity between 2012 (53%) and 2018 (60%) remained low, with only 7 per cent increase in access to electricity for the total population (urban and rural).

Nigeria recorded a 12 per cent nominal and 25 per cent actual increase in proportion of its population with access to electricity between 2010 and 2018. This improvement, though significant, however lags behind the country's increasing electricity demand (IEA et al., 2019 and World Bank, 2019), which was over 14 GW as of 2016 (GIZ, 2016). The implication of which is the doubts it casts on the country's ability to meet its climate change mitigation goals by 2030, especially in the light of such factors as low energy supply and projected growth in

its population size to 263 million by 2030 (United Nations, 2019). There are some encouraging signs in the plans and projections for power generation from diverse sources (see Table 4.8 and 4.9). Off-grid and On-grid were projected to increase from 11MW and 3716MW to 8000MW and 32000MW between 2014 and 2030. An increase in actual terms of 72.627 per cent and 761 per cent respectively. While it can be argued that the baselines are unreasonably low, nonetheless the projected growth in actual terms are encouraging. Equally significant is the projected reduction of 64 per cent in self generation, the largest single contributor to GHG emissions, in the same period. While the projections are important, it is doubtful that the government can achieve its growth projections for off-grid and on-grid electricity generation with resultant decrease in consumers dependence on self-generation. For instance, as shown in Table 4.8, the projected self-generation by means of PHFFGs far surpasses the total combined on-grid and off-grid electrification rates between 2014 and 2020. Whereas the self-generation is targeted to reduce after 2020 (Table 4.9), the growing energy demand, followed by the current electrification rates (Table 4.7), the prevailing economic constraints, and the pace of the energy policy implementation pose a challenge to the realisation of this goal by 2030.

Table 4.7: Population growth and electrification rate between 2010 and 2018.

Year	Population (Million)	Installed capacity (GW)	Annual average generation (GW)	Access to electricity (total population %)	Access to electricity (urban population %)	Access to electricity (rural population %)
2010	159	8.2	4	48	79.8	23.5
2012	167	11	4.1	53	84.4	27.7
2013	172	11.3	4.5	55	83.6	31.6
2014	176	10.7	4.3	55	84.6	29.6
2015	181	11.5	4	53	81.5	25.9
2016	186	12.8	4	59	86	34
2017	191	13.3	4	54	86.8	22.6
2018	196	13.5	4	60	86	34

Source: Author's compilation from Climatescope (2019) and World Bank (2019).

Table 4.8: Projected electricity supply between 2014 and 2020.

Electricity supply	2014	2015	2016	2017	2018	2019	2020
Total off-grid [MWH/H]	11	31	55	150	275	450	540
Total on-grid (FF+RE) [MW]	3716	4188	4476	6288	7767	8969	10273
Self generation (captive) [MW]	13800	13800	12500	12000	11500	11000	10500
Total MW	17527	18019	17031	18438	19542	20419	21313

Source: Authors compilation from the Federal Republic of Nigeria (2016[b]).

Table 4.9: Projected electricity supply between 2021 and 2030.

Electricity supply	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Total off-grid [MWH/H]	810	1053	1385	1844	2487	3394	4688	5625	6751	8000
Total on-grid (FF+RE) [MW]	11690	13232	14904	16722	19684	21843	24307	27300	30060	32000
Self generation (captive) [MW]	10000	9500	9000	8500	8000	7500	7000	6500	6000	5000
Total MW	22500	23785	25290	27067	30170	32737	35995	39426	42811	45000

Source: Authors compilation from the Federal Republic of Nigeria (2016[b]).

In line with the report of Dalberg (2017), interviewees' data shows that even with the effort by the government, as well as through a public-private partnership the deployment of renewable energy remains low. For instance, although there are an increasing number of mini-grid by private developers, there is little evidence of scale achieved so far. The slow pace of implementation of the energy policies is attributed to various factors including unavailability of resources, inadequate finance and challenges with technology transfer (Department of Climate Change, 2018). Similar to existing literature (e.g. Ohiare, 2015; Department of Climate Change, 2018; Dioha & Emodi, 2019), I found that the extent of implementation is determined by the availability of resources.

> How do you think this will be possible in 2030 with all the challenges to implement low-carbon energy? There is low-carbon energy here and there .... scaling up may be a problem. These are very ambitious goals to achieve with our energy demand and the financial challenges. (Interviewee 5, Academic Institute, South East)

> I can say that the energy policy objectives to increase access to energy are being enforced to some extent. Many of the rural areas, which didn't have electricity before, now have renewable energy, but I can't dispute the fact that more still needs to be done because of the high energy demand .....The major challenge is finance. Yes, Nigeria has received some funds... the World Bank and other organisations ...there is still more finance needed to scale up our efforts (Interviewee 56, REA, North)

> Nigeria needs support in different areas, especially with regards to capacity building, research, technical assistance and accessing climate funds as this makes tackling climate change a challenge in Nigeria. (Survey Participant / Interviewee 24, NGO, South West)

> Apart from the government and international agencies, private sectors are also making efforts [through a public-private partnership] to deploy renewable energy in the country. The deployment of low-carbon energy is still slow here. There are different reasons causing this, but financial and technological barriers are some of the problems affecting the scaling-up of low-carbon energy in Nigeria. (Interviewee 26, Private Sector, SW)

Response from interviewees attests that Nigeria's challenge in meeting its growing energy demand and scaling up low-carbon energy and energy efficiency goals have been affected by financial and technological resources, and the same may hamper achievement of its 2030 climate change mitigation goals to reduce energy-related GHG emissions from the residential sector. The total investment required to electrify all households in Nigeria by 2030 is estimated as US$34.5 billion (Ohiare, 2015) and, as identified by interviewees and existing data, between 2011 and 2020, Nigeria received some grants and loans support of about $590,352,810 from bilateral and multilateral partners for implementing its energy policies (Table 4.10). As shown in Table 4.10, the purpose of these funds was to support or upscale renewable energy projects. However, given the amount received to date as opposed to the estimated amount (US$34.5 billion) required, it is obvious that more investment is needed to electrify households in the country. Although, it is not clear what proportion of the funds received was committed to low-carbon energy or electricity generation and project interventions (including e.g. facility installations, capacity building, research, transportation, logistics and project administration), interview and existing data show that financial and technological resources, amongst others,

remain and pose a feasibility constraint upon the effective implementation of low-carbon energy and energy efficiency policies in Nigeria (see Department of Climate Change, 2018).

Table 4.10: Some financial support for low-carbon energy and energy efficiency technologies received between 2011 and 2020.

Fund description	Source	Amount	Duration
Development of Renewable Energy	Bank of Industry/United Nations Development Programme	$4,800,000	2011-2013
Renewable Energy	Climate Investment Fund (CIF)	$85m	2012
Expansion of Green energy and Biofuels (GEB), Bio-refinery project	Sustainable Energy Fund for Africa (SEFA)	$500,000	2012
Energy efficiency and mass	African Development Bank	$200,000,000	2012
Capacity Building for energy transition	Henrich Boll Stiftung (HBS)	€ 849,019 ($981,550)	2012-2016
Promoting clean energy investment through Ministry of Power and five states (NESP)	German Ministry of Cooperation & Development	$27,000,000, €24,000,000 ($27,746,400)	2013-2018
Scaling up small hydro power	Global Environment Facility (GEF)	$2,689,680	2013
Financial intermediation for clean energy through local banks	Climate Investment Funds (CIF)	$50,000,000	2014
Line of credit for RE and Energy Efficiency	Climate Investment Funds (CIF)	$25,000,000	2014
Utility-scale solar PV Project	Climate Investment Funds (CIF)	$25,000,000	2014
Support for private sector solar projects	DFID	$22,000,000	2014-2020
Deployment and transfer of low carbon technologies	Canadian Government	$41,000,000	2014
Technical Assistance	Solar Nigeria	£40,734,781 ($55,725,180)	2014-2020
Universal Green Energy Access Program (UGEAP)	The Green Climate Fund	$16,000,000	2016
RE generation	International Finance Corporation / Department for International Development -UK	$2,500, 000	2016

Global Environment Facility (GEF)	Sustainable fuelwood management	$4,410,000	2016
Total funds received: $590,352,810			

Source: Department of Climate Change (2018), adapted.

In view of the current rate of electrification, energy demand, and feasibility constraint, it seems that while there is a slight improvement in the electrification rate, and a recent growth in the implementation of low-carbon energy projects, it is not certain if, for instance, the NDC goals to: *improve electricity grid, provide energy access to all Nigerians, and significantly reduce the use of small fossil fuel (petrol and diesel) generators,* can be achieved by 2030. This is because achieving these goals require significant upscale in financial and technological commitments. For instance, as expressed in the energy policies, the Nigerian government desires to meet its energy demands from renewable sources and has committed to generating 13 GW of solar power by 2030. This is made clear in its NDC, which emphasises the goal to *provide 13 GW off-grid solar photo voltaic (PV) energy to rural communities that are currently not connected to the national grid* (Federal Ministry of Environment, 2015). The government's interest for low-carbon energy also aligns with one of its SE4ALL Initiative goals to *increase access to modern electricity to a total capacity of 45 GW in 2030* (Federal Ministry of Power, 2016). However, in practice, this desire for low-carbon energy is complicated by the current poor access to energy and financial constraints (Pan African Centre for Climate Policy, 2017).

> It is very important to reduce the emission and address climate change, ...but it is a double goal and challenge for Nigeria, to reduce GHG emissions and to provide energy for all its citizens. ...think about the energy insecurity we have, we first have to supply energy to people, regardless of the source. Low-carbon energy is of course a good idea, but that alone may not solve Nigeria's energy problem now. It is currently financially challenging to do that. (Interviewee 40, Private Sector, South South)

> Although a low-carbon economy is necessary in combating climate change, Nigeria cannot hastily stop the production of crude oil or fully switch to renewable energy. This will adversely affect the country as people are struggling to even get good supply of electricity. Nigeria needs an energy mix, and incentives for poor people to access low-carbon energy. (Survey Participant / Interviewee 48, Min. of Environment, North)

Responses from the survey questionnaires and conversation with interviewees indicate that poor access to clean and adequate energy fuels the desire for any source of energy to address

Nigeria's energy supply challenge. This is also reflected in the projection by the Federal Republic of Nigeria (2016[b]), which shows that as the share of low-carbon energy increases, the fossil fuel energy share from gas, coal and nuclear power will also increase to meet energy needs (Table 4.11). Table 4.11 shows Nigeria's projected energy supply in terms of contributions from renewable energy, gas, coal and nuclear sources. The feasibility of these projections, based on evidence from interviews and existing data, invariably depends on the availability of resources, financial and technical. This implies that, although Nigeria has made commitments to reduce energy-related emissions from the residential and sector, it may not be possible for the country to achieve this by 2030 because it is not currently feasible for the country to fully meet its growing energy demand with renewable energy, due to its current economic status. For instance, the financial cost for the construction of solar power plants in eight states (Enugu, FCT Abuja, Nasarawa, Kaduna, Katsina, Sokoto, Bauchi, and Plateau) to generate 975 MW (0.975 GW) of electricity is estimated as $2.5 billion. This is currently financially challenging for Nigeria as it faces economic downturn, due to the reduction in foreign revenue from low oil prices and foreign reserves that dwindled from $34.49 billion in January 2015 to $30.8 billion in March 2017. As such, the Federal government signed a power purchasing agreement with private investors in 2016. Still, the challenge in fully developing low-carbon energy in Nigeria remains (Pan African Centre for Climate Policy, 2017).

Table 4.11: Projected renewable energy and fossil fuel share of electricity supply.

	2015	**2020**	**2025**	**2030**
Renewable energy (MW)	1112	5325	9695	13800
Gas (MW)	3076	4524	9989	18200
Coal (MW)	0	424	1408	3200
Nuclear (MW)	0	0	1000	2000

Source: Federal Republic of Nigeria (2016[b]), adapted.

The evidence from interviews and existing data supports the fact that the availability of resources, as identified in the conceptual framework, plays a major role in the implementation of renewable and energy efficiency measures, and thus, climate change mitigation policy goals. In the subsequent sections, I examine the influence of resources on the implementation of low-carbon energy and energy efficiency measures.

Resources, Motivation and Feasibility: Implementation of Low-carbon Energy Policies

In this section, I discuss the role of resources as a motivating factor in the implementation of low-carbon energy policies. The importance of resources in policy implementation is reflected in the apparent different electricity connection rates in urban and rural areas. As shown in Table 4.7, within the urban areas, there was a sharp increase in access to electricity between 2010 (79.8%) and 2012 (84.4%) - an improvement attributable to the substantial in renewable energy capacity between 2010 and 2012 (Figure 4.5). Although, there was a 2.9% nominal and 3.4% actual decrease between 2012 (84.4%) and 2015 (81.5%), this was followed by an increase of 4.5% nominal and 5.5% actual between 2015 and 2016. When the analysis is extended to both 2017 and 2018, the improvements in actual terms based on year 2012 as the baseline are 6.5% and 5.5% respectively. These figures indicate a small but steady increase in access to electricity between 2012 and 2018 (see World Bank, 2019).

The increase in access to electricity in urban areas is significant, given the prevailing challenges that include grid constraints, inadequacy in supplies from both hydropower power plants and natural gas. For instance, as highlighted in Part One, natural gas is key input to generating electricity in Nigeria, but its inadequate supply, due to refining facility constraint, impairs supplies to the gas fired plants. More so, hydropower, as a result of low installed capacity, accounts for 0.4% of Nigeria's energy supply (Department of Climate Change, 2018). A situation that informed the government's drive to improve access to energy through the development of hydropower stations, and the construction and rehabilitation of dams to boost electricity generation especially in the urban areas. This is evident in the planned projects by the Federal Ministry of Water Resources to rehabilitate 33 dams, 27 small earth dams and 19 others with a total capacity of 3,557 MW. So far, the rehabilitation of 7 dams with a capacity of 2,269 million m^3 has been completed (Department of Climate Change, 2018). In addition to the recent growth in the on-grid and off-grid low-carbon energy capacity reported by the Nigerian Economic Summit Group (2018) and International Renewable Energy Agency (2019) (see Figure 4.5), this improvement of the hydropower facilities could possibly explain the

overall modest increase in access to electricity between 2012 and 2018 in the urban area, and the influence of resources on the implementation of energy policy in general.

Regarding rural areas, although historically, access to electricity is comparatively low, there are new evidence to show that there is an upward trend in the electrification rate and growth of low-carbon energy in such areas. Similar to the urban areas, there was a sharp increase from 23.5 per cent to 27.7 per cent in the population that had access to electricity between 2010 and 2012. Although in 2015 and 2017, only 26 per cent and 23 per cent, respectively, had access to electricity, this was followed by a nominal 6 per cent point and actual increase of 28% in the population with access to electricity between 2012 (28%) and 2018 (34%) (Table 4.7). Although, there might be other unknown explanation for this increase, the documented result suggests a visible improvement in the access to energy and implementation of low-carbon energy since 2012 – a period when only 28 per cent of the population had access to electricity. Excluding 2015 and 2017, the increase in the electrification rate in rural areas could be attributable to the increasing number of low-carbon energy projects implemented between 2012 and 2018. This can be seen in the substantial increase in renewable energy capacity between 2011 to 2012 and onward to 2018 (Figure 4.5). As disclosed in survey questionnaires and voiced by a senior staff of the Department of Climate Change (DCC):

> The installation of solar panels have increased in urban areas. Mini-grids have also increased in rural areas. (Survey Participant / Interviewee 38, NGO, South South)

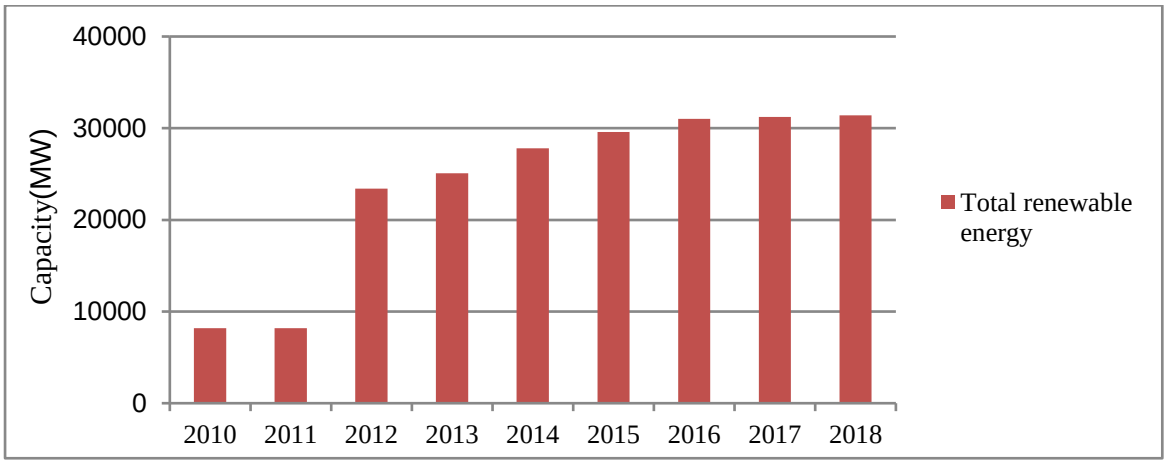
> Nigeria is developing a low emission pathway for climate change through the deployment of renewable energy and energy efficiency. You will find solar panels in many places now ...yes, the development of renewable energy is gradually growing in Nigeria. (Interviewee 42, Dept. of Climate Change, North)

> There are some renewable energy projects. The REA have a few mini-grids projects in the rural areas, and I am seeing more solar panels than before. (Survey Participant / Interviewee 55, NGO, North)

This testimony to the growth of low-carbon energy by interviewees and as indicated in the survey questionnaire is also confirmed by the Nigerian Economic Summit Group (2018) and International Renewable Energy Agency (2019), who report a recent growth in the on-grid and off-grid low-carbon energy capacity in Nigeria (Figure 4.5). This has been particularly observed in the number of solar mini-grids in the country, especially in the rural areas (Rural

Electrification Agency, 2019). Although much is still required, the recent growth in the implementation of low-carbon energy projects could be because many of the rural electrification and low-carbon energy projects have been supported through funding from international donors and private sector operators[23]. In sum, the low electrification rate in the urban area, due to inadequate energy facilities, and the slight growth in low-carbon energy in the rural area, following the funding of low-carbon energy projects, confirm, as posited in the conceptual framework, that resources are the major motivating and feasibility factor for the implementation of low-carbon energy goals in Nigeria.

Figure 4.5: Total renewable energy capacity (MW) between 2010 and 2018.



Source: Authors compilation from the International Renewable Energy Agency (2019).

Resources, Motivation and Feasibility: The Implementation of Energy Efficiency Policies

This section provides evidence that inadequate resources can affect the motivation and feasibility to implement climate change policies. In addition to the low-carbon energy goals,

[23] Some of the funded and implemented energy projects (Appendix 5) include those by the Rural Electrification Agency (REA) under the Federal government of Nigeria, with funds from the World Bank and private sector operators; the Solar Nigeria Programme, funded by the UK Department for International Development (DFID) to increase solar power electrification to underserved communities, including public institutions, such as schools and hospitals in Lagos state and Northern Nigeria; and the Nigerian Energy Support Programme (NESP), which is jointly funded by the European Union (EU) and German Federal Ministry for Economic Cooperation and Development (BMZ) to support Nigeria's implementation of renewable energy and rural electrification actions.

resources also have an influence on the implementation of energy efficiency goals. Energy efficiency is defined as practices that reduce the amount of energy that is required to provide services like lighting, cooling, heating, manufacturing, cooking. It also includes the use of modern energy-efficient appliances as opposed to traditional ones. Energy efficiency is key to Nigeria's energy mitigation goals because, aside from its economic value, it is one of the means to substantially reduce GHG emissions (Oyedepo, 2012). As highlighted in Part One, Nigeria has adopted various energy efficiency policies to reduce energy-related GHG emissions from the residential sector. However, there are different barriers including inadequate technological and financial resources, upon the implementation of these goals (Federal Ministry of Power, 2016 and Department of Climate Change, 2018). Similar to previous findings (e.g. Federal Ministry of the Environment, 2010; Oladipo, 2010; Okoh, 2015), interviewees' and survey responses indicated that limited finance is one of the major constraints that bear upon climate response including the full adoption of renewable energy in Nigeria. As mentioned by a Public Policy lecturer (Interview 35): *'financial constraint is a major problem in Nigeria and this affects the implementation of climate policies including the upscaling of renewable energy'*. This stance was also communicated by other interviewees and survey participants:

> There is an inability to back policy up with adequate budgetary allocation. So, for example, projects are often not being executed due to poor funding. (Survey Participant / Interviewee 4, Min. of Environment, South East)

> Nigeria is faced with different challenges and climate change is just one of them. In order to fight climate change, we need to ensure that climate finance for mitigation and adaptation projects are available. This is not fully the case yet in Nigeria. (Interviewee 20, Lecturer, South West).

> Funding is required to support the implementation of climate policies. We are making efforts to reduce climate change and raise awareness in Nigeria. But what happens without the funding? Nigeria has different economic challnegs. This is the fact. We can't also be ignorant of the impacts of climate change but the finance needed is huge and Nigeria does not have the capacity to do that, …to implement its climate change or low-carbon energy policies with such financial support. (Participant Observation / Interviewee 23, NGO, South West).

> While finance is not the only factor in tackling climate change, it is of major importance in the response to climate change. Government funding in implementing climate change strategies is limited. (Survey Participant / Interviewee 42, Climate Change Dept, North).

> Without enough funding, it will be difficult to build infrastructure to mitigate against the effects of climate change, carry out adaptation projects, as well as some mitigation programmes to reduce emissions in the environment. Yes, there are financial constraints. Nigeria is making efforts to tackle climate change, but lack the required finance to address it. (Interviewee 45, Min. of Environment, North)

Referencing to the SE4ALL goal to: *increase the use of modern cooking fuels and appliances to reach 50 per cent of the population by 2020 and 80 per cent by 2030, from the estimated 10 per cent in 2012*, interviewees and survey participants revealed that there are challenges in implementing this goal, due to financial constraints. These constraints are reflected in the Rural Women Energy Security (RUWES) project, which was launched in 2013 to ensure a safe, affordable and sustainable clean energy access primarily for the rural poor. The project was intended to distribute 20 million clean cooking stoves and small off-grid LED lighting systems to women across the six-geopolitical zones in the country by 2020. Although, over 1.3 million women have registered for the programme, and small off-grid LED lighting systems have been supplied to rural women (Department of Climate Change, 2018), only about 5,000 biomass stoves were distributed in 2017, following major financial drawbacks (Corfee-Morlot et al., 2019). As confirmed by interviewees, there is no evidence that the scheduled 20 million clean cook-stoves have been distributed to date and / or if the goal can be met by 2030.

> The cook-stove project was commissioned a while ago in different parts of rural communities. Until date (2020), most of these women still don't have cook-stoves. This may be due to different factors... I'm not sure. But finance plays a major role (Interviewee 52, NGO, North)

The evidence from interviewees and existing data on the influence of resources on the deployment and scaling up of low-carbon energy and energy efficiency policies is consistent with the existing literature (e.g. Brynard, 2009 and De Boer & Bressers, 2011), which asserts that resources influence the feasibility of a project and the motivation to implement policies. Macintosh & Wilkinson (2015) also make reference to this fact by noting that feasibility constraint can arise from governments' inability, due to lack of resources (e.g. finance) to implement environmental policies. This can also be said of the resource-poor citizens' inability to adopt policy measures, due to lack of resources (e.g. energy) or affordability (e.g. cost of modern energy). For instance, as we will see in Chapters 5 and 6, poor access to energy could pose resistance to public's acceptance (sustained adoption) of low-carbon energy and energy efficient technologies.

Chapter Summary and Conclusion

In this chapter, I presented the findings of the extent that low-carbon energy are being implemented. The findings are based on analysis of interview transcripts and the reviewed policies. Evidence from existing data and interviewees suggests that the extent that climate change mitigation measures in regards to the renewable and energy efficiency goals are being implemented in Nigeria is dependent on the availability of resources. Further to Nigeria's climate change mitigation commitment, it is evident that between 2012 and 2018, Nigeria has taken steps to adopt and approve some low-carbon energy and energy efficiency initiatives and policies. For the energy initiative and policies approved, Nigeria has made some efforts in implementing its low-carbon energy and energy efficiency activities. This includes, the construction and rehabilitation of hydro-electricity facilities, deployment of mini-grids and efficient cooking stoves in the rural areas, and an increase in the number of solar PV, including streetlights and home energy systems, in both the urban and rural areas.

Nevertheless, I found that the progress made to date is not sufficient to meet Nigeria's climate change commitment to reduce energy-related emissions, and increase access to modern energy for its growing population by 2030. The insufficient implementation means that there is a low rate of electrification and poor access to energy for over 60 per cent of the population. The low rate of electrification has resulted to an increase in the use of fuelwood, as over 80 per cent still depend on traditional biomass as their source of energy. Although, there is lack of data on the actual number of PHFFGs in Nigeria, it is estimated that the total capacity of the installed PHFFGs in the residential sector is over 50 per cent of the installed capacity of the national electricity grid. The growing energy demand and the increasing fuel combustion activities in the residential sector therefore pose a challenge to Nigeria's climate change mitigation policy goals to reduce energy-related emissions 2030. There is an urgent need for a substantial effort for Nigeria to meet its energy-related climate change and energy emission mitigation goals by 2030. However, there remain significant challenges because the implementation of its energy goals to date has been hampered by inadequate financial and infrastructural resources; and the scaling up of low-carbon energy and energy efficiency actions may be constrained by the same resources as well as other socio-economic factors including the persistent energy insecurity,

and affordability of low-carbon energy and energy efficiency by the resource-poor population. The findings on the extent to which climate change mitigation policies are being implemented in Nigeria provide the evidence that resources influence the feasibility of, and motivation for, environmental policy implementation in a RDDC like Nigeria.

Whilst financial and technological resources emerged from the interviews and existing data as factors that influence the extent of implementation of energy policies, it is also useful to further examine the implementation of low-carbon energy and energy efficiency policies from the perspective of socio-economic context in relation to resource-poor households. In this case, how resource accessibility and / or affordability factor may influence the motivation for acceptance of, or resistance to, low-carbon energy and energy-efficient measures in Nigeria's residential sector. Using the conceptual framework as a lens, these were the questions that I examine in Chapter 5.

CHAPTER 5

Acceptability, Feasibility, and Resistance: The Socio-economic Constraint of Low-carbon Energy Practices

"*Changes in attitudes and behavior on the part of the public can be a central goal of a movement."* (Stern et al., 1999: 81). *[But] "practices and infrastructures connect, and with electricity in particular, supply and demand are closely interwoven*" (Shove, 2015: 6).

Introduction

Chapter 4 demonstrates that Nigeria has made some progress in its commitment to increase access to low-carbon energy. However, Nigeria is still encumbered with a number of limitations in its attempt to provide its growing population with access to low-carbon energy, and to meet its energy-related GHG emissions mitigation goals within the residential sector by 2030. This chapter addresses research question 2: What are the main socio-economic factors that affect Nigeria's implementation of climate change mitigation policies? and research question 3: How do these factors pose constraints upon the implementation of Nigeria's climate change mitigation policies? Applying the conceptual framework developed in Chapter 2, together with the energy policies discussed in Chapter 4, this chapter provides empirical evidence on the influence of resources on the adoption of low-carbon energy and energy efficiency policies amongst resource-poor households. The chapter is divided into 4 sections. With regards to the extent that the energy goals are being implemented, the first section presents findings on the adoption of low-carbon energy and energy-efficient practices amongst resource-poor households. The second section presents findings on poor accessibility and unavailability of energy resources, and its impact on the acceptability (sustained adoption) amongst resource-poor households. The third section presents findings on lack of affordability of low-carbon energy and energy-efficient practices. The fourth section deals with the issues of environmental awareness and its influence on the acceptability (sustained adoption) of low-energy and energy-efficient practices amongst the resource-poor households.

Acceptability of Low-carbon Energy-efficient Practices

In addition to the extent that energy policies are being implemented, I examined the socio-economic constraints upon the acceptance and sustained adoption of low-carbon energy and energy-efficient practices amongst resource-poor households. To this end, I first investigated the extent of adoption of low-carbon energy and energy-efficient practices in regards to the NDC goal to:

- *significantly reduce the use of small fossil fuel (petrol and diesel) generators;*

The SE4ALL goals to:

- *Increase the use of modern cooking fuels such as electricity, liquefied petroleum gas (LPG), kerosene, biogas and solar cookers to reach 50 per cent of the population by 2020 and 80 per cent by 2030, from the estimated 10 per cent in 2012.* The other 20 per cent households will have access to improved wood cook stoves and efficient charcoal production for cooking;

- *Reduce the use of self-generated power from the 74 per cent level in 2012 to about 49 per cent and 18 per cent in 2020 and 2030 respectively.*

and the NREEP goals to:

- *Replace 40 per cent of its old and inefficient appliances with energy efficient appliances by 2020 and 2030;*

- *Replace all incandescent bulbs with light emitting diodes (LEDs) and other energy saving bulbs by 2025.*

Although there is a recent improvement of the hydropower facilities (Department of Climate Change, 2018) and growth in the deployment of on-grid and off-grid low-carbon energy capacity in Nigeria (Nigerian Economic Summit Group, 2018 and International Renewable Energy Agency, 2019), responses from interviewees and documentary evidence (e.g. Bisu et

al., 2016; Batchelor et al., 2018; Jewitt et al., 2020) show that adoption of low-carbon energy and energy-efficient appliances is low amongst resource-poor people.

> Low-carbon energy and energy-efficient technologies are not yet widely used amongst the general public. It is gradually growing in rural areas. Efficient cooking stoves have been deployed to some rural areas. Some of the women are now using cooking stoves, but the percentage is very low. The government is trying to make LPG more accessible to Nigerians. This is all in the pipeline. (Interviewee 14, Min. of Environment, South West)

> Energy efficiency is not popular at the moment. But, there are solar panels in some places now. These were not there two, three years ago. The use of low-carbon energy and energy-efficient appliances is very low amongst the general public. Not many people are using the low-carbon energy yet. (Interviewee 17, Lecturer, South West)

The studies cited above show that the adoption of low-carbon energy and energy-efficient technologies, in the household sector, is challenged by various socio-economic factors. These findings are reflected in the testimony of interviewees. The three themes that emerged from the interview data are: 1) Poor access and unavailability of resources, 2) Lack of awareness / information, and 3) Feasibility and resistance.

Although awareness of them is gradually growing, the use of low-carbon cooking fuels such as Liquefied Petroleum Gas (LPG) and energy-efficient appliances for cooking (electric cookers, solar cookers and improved cookstoves) is still low amongst the resource-poor households, in both urban and rural areas. The use of energy efficient appliances such as refrigerators, fans, and home electronics is still very low, especially amongst the resource-poor population. In rural areas, the awareness and use of low-carbon and efficient energy for lighting, and improved cook stoves, is gradually growing. However, the use of LPG for cooking is very low. The sustained adoption is constrained by poor accessibility to, and unavailability of, energy resources, lack of affordability of low-carbon energy and energy-efficient appliances, as well as lack of environmental awareness amongst resource-poor households. However, this study found that environmental awareness on its own is not a key motivator for the sustained adoption of renewable energy and energy-efficient practices among resource-poor households. I discuss the identified constraints in the subsequent sections.

Lack of Awareness / Information and Pro-environmental Practices

One of the constraints against the acceptance and sustained adoption of low-energy and energy-efficient practices amongst the resource-poor households is the lack of awareness of energy-efficient resources. As highlighted in Chapter 2, information is a key factor to policy implementation. This is because actors usually make sense of the world through the information available to them, without which it is almost impossible for actors to act (Hajer, 1997). This could include access to information or having awareness about energy-related GHG emission and, mitigation measures such as the adoption of low-carbon energy and energy-efficient practices. To promote pro-environmental behaviours including energy-efficient practices in Nigeria, one of the NCCPRS goals is to: *"significantly increase public awareness and involve private sector participation in addressing the challenges of climate change."* This goal is consistent with the revised National Environmental Policy (1999) goal to: *"raise public awareness and promote understanding of essential linkages between environment and development and to encourage individual and community participation in environmental improvement efforts"* (Federal Ministry of Environment, 2016). Echoing existing findings (e.g. Farauta et al., 2012; Odjugo, 2013; Hussaini, 2015), interviewees acknowledged the promotion efforts of government and NGOs; nevertheless pro-environmental practices amongst the grassroots population, is still low, especially in rural areas.

> The level of environmental awareness amongst the grassroots is poor. A majority of the people are not energy-efficient conscious. Some may be aware, but they still don't practice it. Climate change awareness and emissions mitigation measures should be increased amongst the grassroots .....urban poor and rural people as this will increase their knowledge and participation in climate action and energy efficiency measures. It is worse in the rural areas, but even some of the people in the urban areas still do not have a clue. (Interviewee 6, Academic Institute, South East)

> Awareness is gradually growing. But people are still using solid fuels and small generators. Energy efficiency practice is very poor. There are some level of awareness being done by NGOs and the government ...environmental sensitisation campaigns, awareness in the media. More awareness is needed ...the public needs to be educated on how they can help reduce emissions .....to promote a consciousness of energy efficiency. (Interviewee 23, NGO, South West)

> Many people are using small generator and firewood because of poor knowledge about the effects on the environment. Public awareness is gradually increasing in Nigeria, but there is need for more to be done. Knowledge about low-carbon energy is still low. Awareness needs to be increased on energy efficiency and low-carbon energy amongst the grassroots in towns and villages, ...it is worse in the villages. (Survey Participant / Interviewee 25, NGO, South West)

Interviewees testify that awareness of solar energy is gradually growing both in the urban and rural areas. Large numbers of people also know about LPG for cooking. This is attributable to the fact that LPG has been in use (amongst the rich) in Nigeria since the 1980s (World Bank, 2004). The awareness of solar energy can be understood from the recent growth in the deployment of on-grid and off-grid low-carbon energy capacity (Nigerian Economic Summit Group, 2018 and International Renewable Energy Agency, 2019), as discussed in Chapter 4. As noted by a staff of the DCC:

> They are not hidden, you see the solar panels, people see them, on the roof, there are street lights, ...many people are now aware of solar energy. LPG has been used for cooking in Nigeria for a very long time, so the people know of LPG too. (Interviewee 41, Dept. of Climate Change, North)

> They are not everywhere yet ...but there are more solar panels now than a few years ago. They are mostly in urban areas, ...the rural areas are using mini-grids, but there are also some solar panels in few places. People are now seeing more of these. Not many can afford it yet. They desire to have it to supply them energy. (Interviewee 17, Lecturer, South West)

In addition to the growth in on-grid and off-grid energy, the awareness of low-carbon energy can also be understood from the recent sensitisation programmes - NCCPRS environmental awareness goals and the campaign by various NGOs and governmental agencies. For example, the Energy Commission of Nigeria has been charged, amongst other duties, with the development and optimal utilization of all energy resources, as well as energy efficiency and conservation in all sectors of the economy including households (Gana & Hoppe, 2017). To further the NCCPRS policy and Energy Commission of Nigeria goals, Nigeria commenced public awareness efforts to promote the adoption and use of low-carbon energy and energy-efficient technologies. Some of the recent efforts to raise public awareness include the Clean Energy for Cooking Sensitization Campaign. As noted in Chapter 4, the campaign was initiated by the Federal Ministry of Environment, Federal Ministry of Women Affairs and

International Centre for Energy, Environment and Development to create an awareness on the negative impact of firewood on the environment, and to promote clean cooking stoves (Department of Climate Change, 2018).

Despite this increasing awareness of low-carbon energy, the poor knowledge of environmental issues and mitigation remain disturbingly strong amongst the resource-poor population. This knowledge deficit is argued to limit the adoption of low-carbon energy and energy-efficient practices. For instance, interviewees revealed that many resource-poor households still use unsustainable energy, due to poor knowledge of energy efficient technologies. In line with previous studies (e.g. Ozoh et al., 2018 and Ihemtuge & Aimikhe, 2020), interviewees' and the survey responses revealed that poor adoption of LPG amongst the poor may be partly attributable to perception of its risks to their health, a perception which is associated with poor knowledge of low-carbon energy and its benefits for the environment.

> Many people in the rural areas believe that using cooking gas is dangerous and could cause fire ...a few people in urban communities too ....it is not as much as it is in the rural area because there is more awareness in urban areas. I remember some years ago as a Youth Corper, my landlord refused to rent his property to anyone with a gas cooker. He didn't mind you using kerosene stove or even firewood in the public kitchen outside, but refused the use of gas cookers. Even my friend's sister had the same experience years later with another landlord. Many people can't relate with energy emissions or if unsustainable activities increase GHG emissions. They don't see it that way. The problem is mostly due to poor environmental knowledge by many people in the country. (Interviewee 4, Min. of Environment, South East)

> A lot of people in the villages use fire. There is this general perception that LPG can cause easily cause fire and burn their houses (Survey Participant / Interviewee 25, NGO, South West)

Interviewees also revealed that the knowledge deficit promotes a socio-cultural belief relating to the use of firewood. Echoing similar findings (Saad & Bugaje, 2016 and Akintan et al., 2018), interviewees point out that there is a belief, especially by many people in the rural areas, that food tastes better when cooked with firewood than LPG or other low-carbon stoves. The combination of identified socio-economic factors is profound and therefore explains poor knowledge of environmental awareness and adoption of low-carbon energy amongst the resource-poor segment of the Nigerian communities.

> There are still challenges with the adoption of solar energy and LPG, it will take more awareness ... people are still using solid fuels ....awareness is gradually building, ...but not many people have adopted these modern energy .....some are slowly buying into it ...some of these rural areas, some people are using cookstoves, but the scale of adoption is still very low if you compare it to the masses .....there are different reasons, cost, socio-cultural beliefs ....some people say that they prefer to use firewood because it taste better. Poor awareness of environmental impact of inefficient energy doesn't help .....there are sensitisation programmes ...but the poor access to energy also affect awareness, like TV programmes to raise awareness. (Interviewee 56, REA, North)

This interviewee's point about the negative relationship between access to energy resources and awareness amongst the resource-poor is similar to the argument of Odjugo (2013) that poor awareness of climate change amongst the rural populace could be linked to poor access to TV broadcasts on climate change issues, owing to poor access to electricity. For instance, investigating the awareness of climate change by farmers in rural Nigeria, Farauta et al. (2011) found that, although there seems to be a high level of climate change awareness raised through the media in the north, about 84% of farmers in rural regions who testified to the change in weather, are ignorant of the effects of climate change and climate change mitigation measures. It could be argued that the low level of understanding of climate change amongst the farmers is due to the poor access to energy resources in the rural parts of northern Nigeria. This issue of poor access to energy perhaps can be related to the increased use of firewood in the rural places; whereas there is also energy poverty and high costs of kerosene and LPG in urban areas, studies (e.g. National Bureau of Statistics, 2016) show that the use of firewood is less there (Figure 4.2). There could be various reasons for this disparity in the use of firewood. One is that, although the low education level in rural areas has been associated with poor understanding of environmental issues and minimal use of low-carbon energy (e.g. Ghiurca et al., 2012 and Rahut et al., 2018), the disparity could be because fuelwood is more accessible in the rural areas (Zaku et al., 2013; Kumar et al., 2016; Imran et al., 2019). Moreover, because income disparities between the urban and rural areas make energy more affordable for urban communities, the increased use of firewood in rural areas could be because urban areas have more access to energy than the rural areas. As a result, people in urban areas have more access to the media, and consequently, better awareness of environmental issues, which perhaps results in the reduction in the use of firewood in urban rather than rural areas.

These findings on public awareness to an extent confirm the argument as posited in the conceptual framework, that information (which is also conceptualised as resources) can influence the implementation of environmental management measures. This is seen in the increasing awareness of low-carbon energy such as solar PV and LPG, and the link between the urban areas' access to media (information) and use of cleaner energy cooking practices than in the rural areas. Nevertheless, as I have already mentioned, interviewees argued that knowledge of climate change mitigation measures including the use of low-carbon energy and energy-efficient technologies (e.g. energy-efficient cookers, heating, refrigerator, light bulbs) is still low amongst a majority of the Nigerian population (Farauta et al., 2012; Onyekuru & Marchant, 2012; Gana & Hoppe, 2017; Hussaini, 2018). As confirmed by interviewees' and survey data, there is still more to be desired amongst the urban poor because they still use inefficient energy including firewood and PHFFGs.

> There is still more to be done both in the rural and urban areas. People need to know that fuel-powered domestic generators increase emissions. There is energy challenge though. Many people are still using firewood .... because of poor energy supply, but there is also poor awareness. (Survey Participant / Interviewee 14, Min. of Environment, South West)

> Awareness about environmental pollution and efficient energy practices is promoted by the government and NGOs in Nigeria. Invariably, this is done through media on specific international days to mark celebrations. This is not enough to reduce GHG emissions or instill energy efficiency. Many people soon forget about the issue .....awareness is poor even amongst the urban area dwellers. (Interviewee 40, Private Sector, South South)

Interviewees and survey participants suggest the need for increased environmental awareness, both in the rural and urban areas, to promote climate change mitigation including low-carbon energy and energy-efficient practices. This includes creating more awareness in languages that are accessible to people, who may not understand English, as well as ensuring that people understand more of the effects of the use of firewood and diesel fuel generators on the environment. However, they argued that, whilst raising awareness is critical for the reduction of GHG emissions from the residential sectors, this may not have much impact on the sustained adoption of low-carbon energy and energy-efficient practices amongst the resource-poor population, without more practical actions to increase access to, and for the affordability of, energy resources.

As it currently is here, people use energy not because it is renewable, but it is available, and if they can afford it, then they get it. Raising public awareness may just be empty words, if there are no practical actions to promote public acceptance and sustained adoption of low-carbon energy. Poor supply of energy is a challenge. Awareness is good. It is necessary. To reduce emissions we need to go past 'just getting it' [renewable energy] only for access, people need to understand the benefit for the environment. But, you can't practice energy efficiency if you don't have the means to ....what if they can't afford it? Then the awareness and adoption won't be sustained. It is complicated. They have many challenges. You will see some households buy it, but can't use it all the time. Even when they use LPG, they still use kerosene, firewood and charcoal. Sometimes they stop, when they can't refill it. There are no incentives or solid actions in place to encourage adoption of clean energy. It is not just poor knowledge or socio-cultural factor. There is poor access to energy and lack of affordability factors too. All these issues need to be considered for sustained adoption. This should be the focus. (Interviewee 9, NGO, South East)

I understand that.... yes, poor awareness of environmental issues and protection and all that... The awareness is still low. .... but poor electricity supply too. Low-carbon energy needs to be scaled up and affordable. You will find that a lot of people are even unemployed and just trying to make ends meet ....even the employed people on low-income struggle. There needs to be some kind of subsidies to attract or enable them to adopt and continue using low-carbon energy and energy-efficient appliances. (Interviewee 17, Lecturer, South West)

Public awareness is important but it is secondary. Issues of poor access to energy and affordability of low-carbon energy by the low-income population should be prioritised ....these factors may stand in the way of public participation and / or acceptability of adopting low-carbon energy. The consideration of the influence of socio-economic context is important. It is important for us to educate people on these issues, but we also need to create avenues for them to help tackle climate change. For example, the government can subsidise solar panel, so it is cheaper for poor people to access. This is crucial because it will help the poor people ....it will increase adoption and reduce our CO_2 emissions. (Participant Observation / Interviewee 26, CSO, South West).

They need to know why they can't use firewood and diesel fuel generators, and they also need to have and be able to pay for the cost of clean energy, otherwise, it will not be easy to adopt..... you can adopt the policies, but with implementing the measures is totally different, ...people don't mind any type of energy as long as they have it, if you give them what they can't afford, ...it is a problem, they will not accept it, ...they will not participate... the change may be difficult for the low income households to accept, they will complain [resist], ...all the awareness can be raised, but, they need to be motivated

> and have the resources to participate....if they can't afford it, that is a problem. (Interviewee 38, NGO, South South)

Interviewees' responses are consistent with the argument by Shove (2015). Considering usage of low-carbon electricity and electric cars, Shove points out how the uptake of low-carbon energy is dependent on people's willingness to substitute low-carbon technologies for conventional ones. Nevertheless, Shove argues that such willingness could practically be observed where there is availability of technologies to deliver the required power. Similarly, the findings of the World Bank (2014), which show that whilst awareness of clean and improved solutions as well as their benefits is an important demand driver for the acceptance and sustained use of new cooking technologies, this may not be the case in every country. The study by the World Bank on the adoption of improved cookstoves in SSA countries demonstrates that, amongst the various demand drivers, including awareness, access and affordability of improved cookstoves, the latter represents the strongest motivator for poorer consumers' willingness to adopt cookstoves in SSA.

Interviewees argued that access to and affordability of low-carbon energy by the low-income population should be prioritised. They suggested that the adoption of low-carbon energy and energy-efficient appliances can be facilitated through the provision of subsidies by the government. Otherwise, acceptance and sustained adoption of low carbon energy and energy efficient practices could be hindered. Evidence from interviewees also aligns with the study by Bisu et al. (2016) showed the use of LPG, electricity and solar energy to be positively affected by household increased income, leading to a decline in the use of firewood, charcoal and kerosene in Bauchi State, Nigeria. This implies that, as posited in the conceptual framework, the acceptability of environmental policies or measures by resource-poor people is influenced by access and affordability of resources. Essentially, poor access to and unaffordability of resources makes the adoption of environmental measures infeasible for the resource-poor and could result in resistance to such measures.

Poor Accessibility and Unavailability of Resources

Poor accessibility and unavailability of low-carbon energy resources were reported as some of the major factors that affect the rate of acceptance and sustained use of low-carbon energy and energy-efficient practices (e.g. lighting, cooking, refrigeration) amongst the resource-poor population, especially in rural areas. The argument is that the demand for energy and poor access to energy (e.g. electricity and LPG) will further drive the need for unsustainable energy sources including fuelwood for cooking and portable fossil fuel generators (PHFFGs) for household energy. Similar to existing findings (Oyedepo, 2012 and Jewitt et al., 2020) interviewees emphasised that, in regards to cooking, poor access to energy is one of the factors that inhibits the acceptance and sustained use of LPG in rural areas.

> LPG is not widely used in rural areas, people have not fully adopted it, but it is gradually growing there. It is more common in urban areas for those who can afford it. Access is poor in rural areas. Some of the reasons are shortage of gas cylinders and unavailability of the gas (Interviewee 36, Lecturer, South South)

> The use of LPG is low, especially in the rural areas. Not many people are aware of the benefits of renewable energy yet. There is a high preference for firewood usage in the rural areas. But, there is also poor access to energy, which is a major problem. (Survey Participant / Interviewee 37, NGO, South South)

Responses from interviewees revealed that, whereas the use of LPG is growing in Nigeria, its acceptance and sustained adoption is still slow amongst the resource-poor population, especially in rural areas. These findings correspond with that of Ihemtuge & Aimikhe (2020), who report that in spite of Nigeria being the leading exporter of LPG in Africa, and the growth in local consumption over the years, LPG remains the least used of the major cooking fuels (firewood, kerosene, charcoal, LPG) in Nigeria. For instance, in 2016, only 17 per cent of LPG produced in Nigeria was consumed by the domestic market (Clean Cooking Alliance, 2016). With consumption capacity at about 15 per cent of the total LPG produced annually and per capita consumption rate at 1.8kg, Nigeria has one of the lowest per capita LPG consumption rates in Africa (South Africa, 5.5kg and Morocco, 44kg) (Ihemtuge & Aimikhe, 2020), and comparatively less than other West African countries such as Ghana (4.7kg) and Senegal (9kg) (Abdul-Kadir, 2015).

As highlighted by survey participants and interviewees, the reasons for the slow uptake of LPG in rural places, and even amongst the urban poor, include the shortage of cylinders and unavailability of LPG.

> Lack of cyclinders and poor access to LPG are major challenges to the adoption of LPG in Nigeria, especially in rural areas. (Survey Participant / Interviewee 5, Research Institute, South East)

> A majority of people don't have gas cylinders. Refilling the cylinder is also a challenge for rural people, gas plants are not accessible, they have to travel to town to refill, this can be very stressful for people without cars and it is also not financially feasible for the poor. (Interviewee 14, Min. of Environment, South West)

Interviewees' responses echo extant findings (e.g. Ministry of Petroleum Resources, 2017) on the limited number of gas cylinders. There are currently about 1.5 million cylinders, which is far below the minimum requirement of 100 million LPG cylinders in relation to the population. As documented by the Ministry of Petroleum Resources (2017), the shortage is partly due to local cylinder manufacturing capacity, which makes it unaffordable to resource-poor people. Thus the lack of gas cylinders in Nigeria affects the acceptance and sustained adoption of LPG for cooking, and consequently increases the use of fuelwood for cooking.

To remedy the shortage of LPG cylinders, the Nigerian government has plans to invest in 600,000 gas cylinders to encourage usage of LPG. In line with this plan, ownership of gas cylinders will rest with the dealers and distributors, thereby reducing the costs for the end-users (Vanguard, 2019). This plan is in line with operationalising the Nigerian Gas Policy, which was introduced in 2017 to promote the phased injection of 20 million cylinders over a period of 5 years. Part of the goals of this policy is to boost the rapid adoption and use of LPG through pilot schemes combined with behaviour change programmes (one in the north and another in the south) and the distribution of free handouts of small LPG cylinders, cookers and basic supply to the poor. Thereafter, consumers are to pay for their supplies of LPG fuel (Ministry of Petroleum Resources, 2017). However, interviewees warn that the success of this program will be determined by the sustained use of LPG, which is dependent on various factors including affordability (e.g. cost of refilling the cylinder). I discuss the constraints of cost of low-carbon energy and energy-efficient practices in the subsequent section.

Interviewees also highlighted the issue of unavailability of LPG as a constraint on the success of the planned investment to encourage the acceptability of LPG as a fuel of choice amongst the resource-poor population.

> The plan is to encourage people to use LPG for their cooking needs. That is why the government is injecting more cylinders ....a majority of Nigerians don't have cylinders ....but this may also not have much impact, without access to and availability of LPG. Scarcity is a problem and lack of bottling plants are major problems. (Interviewee 5, Academic Institute, South East)

The argument by interviewees on unavailability of LPG corresponds with the report of the Ministry of Petroleum Resources (2017), which discloses that, despite all the interventions by the Nigerian government, the transformation towards making LPG the primary cooking fuel has not been very successful because many Nigerian households do not have access to LPG, and those who already use LPG suffer periodic scarcities, due to insufficient LPG product for the domestic market.

The unavailability of LPG is worse for the poor rural and urban households. A study by Ozoh et al. (2018) on factors associated with household choice of kerosene or LPG in Lagos State, showed that even in urban area, the unavailability of the fuel is also observed. The study by Ozoh and colleagues revealed that unavailability of LPG fuel was one of the main reasons people switched from the use of LPG to kerosene, which is readily available. The scarcity of fuel is caused by the inadequate refining capacity in Nigeria. Even though, Nigeria has a vast reserve of gas, most of its LPG product is exported[24], with over 80 per cent exported in 2016 (Clean Cooking Alliance, 2016), mainly due to infrastructural challenges in refining LPG for the domestic market. For instance, the composition of some of the exported product is unsuitable for the local market and the infrastructure for the exported product is not readily adaptable to domestic supply (World Bank, 2004). Due to the inadequate domestic refining capacity, Nigeria depends largely on imported LPG to service the domestic market. However,

[24] Nigeria currently produces approximately 4mt per annum of LPG, largely for exports. The production is mostly from natural gas processing and some smaller production from the Nigerian National Petroleum Cooperation (NNPC) refineries in Warri, Port Harcourt and Kaduna. The major source of LPG for domestic consumption is currently from the gas processing facilities, especially the Nigerian LNG (NLNG) company (Ministry of Petroleum Resources, 2017).

the challenges of importing the refined fuel often result in scarcity and inadequate supply of LPG to the domestic market, due to lack of jetties to receive the imported product (Ministry of Petroleum Resources, 2017).

Other infrastructural challenges causing the scarcity of LPG include limited depot facilities to store the refined imported product, and limited road and rail infrastructure transport LPG from Nigeria's Apapa and Calabar ports to distribution terminals within the country. There are currently approximately only 900 functioning trucks nationwide with a total transport capacity of around 2,000 tonnes. Added to the challenge of poor infrastructure is the lack of distribution terminals (bottling plants). Currently, there are only 200 distribution terminals around the country with around 13,000 tonnes capacity in total (Ministry of Petroleum Resources, 2017). These infrastructural capacities are insufficient for the domestic market and increase the scarcity of LPG in Nigeria plus make the adoption of LPG more difficult for the rural communities, especially for poor households who lack the wherewithal to travel to the available locations for cylinder refilling (World Bank, 2004 and Okereke, 2020). There are several reported and documented cases of people in the rural communities travelling long distances to refill their gas cylinders. In addition to the disruption to their usual activities, travelling to refill their gas cylinders also involves additional financial burdens (Jewitt et al., 2020 and Okereke, 2020).

> People have trouble refilling their cylinders, this is even challenging during periods of fuel scarcity in the rural areas. Most villages don't have gas bottling plant, ...people have to go to the nearest town to get it refilled, this makes it expensive for them. It is a barrier to using LPG in rural areas. (Interviewee 51, NGO, North)

In addition to the poor access to and unavailability of LPG for cooking, interviewees and survey participants also highlight that uptake of the improved cookstoves in the rural communities is hindered by financial cost challenges.

> There are various ongoing cookstoves programmes now. Deployment to rural areas needs to be scaled up. Aside from the government, NGOs and private sectors are also distributing the improved cookstoves. Many women are adopting it, but adoption is still slow in many rural communities if compared to the population of the rural areas. There are varied reasons, including poor access to finance and distribution to the rural areas. Sales agents take them to rural areas, but they can only do as much because of the

> distance to many of the interior rural areas, and they are also constrained by the poor road networks in Nigeria. (Interviewee 17, Lecturer, South West)

> The initial financial cost and cost of refilling LPG cylinders are some reasons for the slow adoption of cooking gas by the poor people. (Survey Participant / Interviewee 39, NGO, South South)

Interviewees' responses show that, in spite of the challenges of deployment by the government (see Chapter 4), the improved cookstove market is gradually growing in Nigeria. For instance, about 730,000 improved cookstoves were sold in 2015. However, adoption is still slow in rural areas, due to poor access to distribution centres and finance. The findings from interviewees correspond with existing studies (e.g. Eleri et al., 2012; ChristianAid, 2015; Climate and Clean Air Coalition, 2017; Onyeneke, 2019), which emphasise the need for increased access to improved cookstoves through effective distribution arrangements to rural areas and complementary financial assistance for the poor households. I discuss the affordability of low-carbon-energy in the subsequent section.

Poor access to hydro-electricity was also reported as a constraint to the regular use of electricity for lighting, refrigeration, watching TV, and electric cooking, thereby increasing the use of PHFFGs. As noted by a survey participant, "*electric cookers are not commonly used now because of the inadequate electricity supply. It is even worse in the rural areas with poor supply of electricity.*" (Survey participant / Interviewee 39, NGO, South South). Other interviewees also reported similar issues:

> Access to hydropower is currently a challenge in Nigeria, not many people are cooking with electric cookers. People who have the combined gas and electric cookers, you will find that only the gas is used because of the poor access to electricity, if you don't have gas cooker, then you use kerosene and firewood. A lot of the low income people, that is what they use, ...yes, in urban areas as well, but mostly in the rural parts of the country. (Interviewee 47, Min. of Environment, North)

> You can stay sometimes for a day or even days without decent electricity, you may not even have it at all for a day or so, it was worse before ....for days you may not have electricity, so you fall back to using small generator, almost everyone has it. Some people are able to afford solar and inverter, but not many Nigerians can afford this, ...for those who can't, then they have to depend on portable diesel generator. There are some who can't ....people use firewood because they don't have access to regular electricity. (Interviewee 52, NGO, North)

Interviewees' and survey questionnaire responses correspond with existing studies (e.g. Oyedepo, 2012; Kabir et al., 2018; Jewitt et al., 2020), which confirm that the use of electric cookers has rapidly declined over the years, due to the poor power supply. It is virtually non-existent in rural areas, due to the poor connection to the national grid (see Chapter 4). Echoing existing studies, interviewees noted that whilst the rich are able to access different sources of energy including solar energy or power inverters, the resource-poor people mostly depend on the national grid for energy supply. Thus, with the poor access to low-carbon energy supply, resource-poor households are left to access inefficient energy sources such as firewood for cooking, and PHFFG.

Feasibility and Resistance

Lack of affordability of low-carbon energy and energy-efficient appliances was reported as one of the main socio-economic factors that affect the acceptability and sustained adoption of low-carbon energy and energy-efficient practices amongst the resource-poor population. Interviewees noted that cooking with electricity or LPG is not an affordable option for resource-poor households in Nigeria. The increased use of fuelwood in the rural communities is largely the result of the poor access to refill locations, unavailability, and prohibitive cost of LPG, cylinders, or electric cookers (Onwuka, 2006; Babagana et al., 2012; Okoruwa, 2014; Ogundipe, 2017). This evidence corresponds with previous studies (e.g. Bisu et al., 2016; Ministry of Petroleum Resources, 2017; Batchelor et al., 2018; Jewitt et al., 2020; Okereke, 2020), which report cost and affordability as socio-economic barriers to cooking with LPG and electricity in SSA countries, including Nigeria.

> The cost of efficient energy is a major constraint. .... the reason rural people collect firewood in the first place is mostly due to poverty ... they can't afford the alternatives. Resource-poor people don't go for LPG because the initial cost of LPG is high for them. Even in urban areas .... the urban poor cannot afford it. They use kerosene stoves. .... many still use firewood (Interviewee 39, NGO, South South).

> Cooking with electricity is out of the question for them now because access to electricity is poor, Electric cookers is not an affordable option, except they have solar energy .... that is currently out of their reach because they can't afford it. The cost of solar systems is still high for the majority of Nigerians. Many people are resource-poor .....unemployed. (Interviewee 51, NGO, North)

Interviewees highlight lack of affordability as a barrier to adopting low-carbon energy. This includes the initial cost of the LPG starter pack (e.g. cylinder, stoves, hoses and regulators) and the ongoing cost of refilling the gas cylinder. In addition to gas cylinders, they also have to purchase the other LPG starter equipment. This initial cost places a financial burden on resource-poor people. Hence, for instance, besides the increased use of fuelwood is also the use of kerosene, amongst resource-poor households. This is because the initial cost of acquiring an LPG cooking pack is far higher as compared to other fuels (Ministry of Petroleum Resources, 2017 and Okereke, 2020). Although, the use of kerosene is more expensive than LPG in the long term (Federal Ministry of Power, 2016), the average starter pack to a potential user, which is 83 per cent higher than starting with kerosene stove for cooking (Federal Ministry of Power, 2016), is found to be a deterring factor for the adoption of LPG by resource-poor households (Ministry of Petroleum Resources, 2017), who also lack access to loans or flexible payment plans to support initial costs of LPG (Dioha & Emodi, 2019 and Okereke, 2020).

Beside the initial costs of LPG starter pack, the costs of refilling LPG cylinders are high. As opposed to fuelwood and kerosene that can be purchased in small daily amounts, LPG requires the purchase of a full cylinder sizes of 5-6 kg and 12-14 kg. Whereas the LPG may cost less than traditional fuels over time, the larger size of the LPG refill transaction can pose a financial burden on resource-poor households, who are already accustomed to incremental purchasing of household fuels through frequent small transactions (Puzzolo, 2020). For instance, the price of a bundle of firewood is between naira (N)400 to N600 ($1.10 - $1.64) (Premium Times, 2019), and an average price of kerosene per liter is N305.55 ($.0.84) (Nairametrics, 2019); by comparison, the average cost of refilling a 12.5kg cylinder, which lasts about a month for a family of five, is between N4,223.08 to N4,685.05 ($11-$13) (Guardian, 2019). Although the cost of traditional cooking is high in the long term (and the health and environmental benefits of low-carbon energy are desired), the price of LPG may still be unaffordable for a household with a monthly wage of about N20,000 ($55); with competing spending priorities (e.g. children's school fees, rent, food, water, healthcare, transport and other basic essentials), the adoption of LPG may be secondary (Akintan et al., 2018 and Jewitt et al., 2020). This is even worse for the majority of Nigerians, who are unemployed.

The high cost of LPG is due to various reasons including as aforementioned, scarcity as result of inadequate infrastructural facilities, distribution network to end-users, and insufficient LPG product for the domestic market (Oyedepo, 2012; Ministry of Petroleum Resources, 2017; Ihemtuge & Aimikhe, 2020). This also creates price inflation by local merchants, thereby making the fuel unaffordable to resource-poor households.

> Fuel shortage in Nigeria, owing to the challenges of fuel importation due to Nigeria's inadequate refining capacity, is promoting energy poverty. Even though there is a Petroleum Equalisation Fund established by Decree No. 9 of 1975 (as amended by Decree No. 32 of 1989) to ensure a Uniform Price Mechanism and guard against such discrepancies across the country, it does not always work out that way in reality, as local merchants tend to inflate fuel prices during fuel scarcity in Nigeria, making it unaffordable to a majority of Nigerians, but the low income people, especially in the rural areas, suffer more. (Interviewee 28, Ministry of Environment, South South)

Nigeria's poor road networks and the cost of transporting these resources to rural areas mean that rural dwellers often pay slightly more for gas than the official price (Oyedepo, 2012). This is especially so during periods of fuel shortage, which are frequent in the country and invariably last for long periods. These challenging structural factors make the use of firewood a more attractive option for domestic energy needs, particularly in the rural areas, because it is more accessible, available and affordable to them. This implies that, even with the Nigerian government's planned investment to encourage usage of LPG, both in urban and rural areas, it could be argued that this goal may only be partially successful, due to the running costs of LPG, which may be too expensive for resource-poor end-users.

To achieve the NDC goals to: *significantly reduce the use of small fossil fuel (petrol and diesel) generators; and the* NREEP goals to: *replace 40 per cent of the country's old and inefficient appliances with energy efficient appliances by 2030; and replace all incandescent bulbs with light emitting diodes (LEDs) and other energy saving bulbs by 2025*, will also require citizens to start using low-carbon energy and energy-efficient appliances. However, interviewees and survey participants warn that, in addition to the affordability constraint of LPG, is the constraints upon adopting low-carbon energy such as solar home systems, and energy-efficient practices such as the use of energy saving bulbs, refrigerators, cookers and other energy efficient electronic appliances.

> The rural areas through electrification projects are benefitting from mini-grids ...there are a few solar home systems scattered around for small-scale activities. These are installed by the government and there are small development by the private sector too. Adoption is still low in urban areas. Some affluent individuals are starting to adopt modern energy like solar power generation, but it is still a small scale when compared to the general masses ...this has not been generally available to a large number of people, owing to the cost of solar panels and other installation equipment. The most you see low-income people get is the small solar lamps for lighting. (Interviewee 17, Lecturer, South West)

> There are solar panels in some places. They are owned by the rich. The cost of the installation and the solar panels is not what the poor can afford. They use what they can afford not renewable energy. Thye use firewood and kerosene for cooking. They don't use low energy bulbs. It is expensive for them. (Survey Participant / Interviewee 38, NGO, South South)

> Low-carbon energy like solar PV is still a luxury in Nigeria, some individuals are now buying into it, but these people are only a small percentage of the population because they are the ones who can afford it. Adoption is very low amongst the low-income people in urban areas .....they are becoming more aware of it, but it is not currently affordable to them. A majority of the people still use inefficient appliances. Incandescent bulbs, generators, firewood, and the likes, that is what they can afford (Interviewee 50, Lecturer, North**)**

> Low-carbon energy like solar PV is still a luxury in Nigeria, some individuals are now buying into it, but these people are only a small percentage of the population because they are the ones who can afford it. Adoption is very low amongst the low-income people in urban areas .....they are becoming more aware of it, but it is not currently affordable to them. A majority of the people still use inefficient appliances. Incandescent bulbs, generators, firewood, and the likes, that is what they can afford (Interviewee 50, Lecturer, North**)**

The response from interviewees revealed that the adoption of solar energy is still low amongst the resource-poor households. The findings from interviewees correspond with existing studies (e.g. Eronini, 2014 and Bisu et al., 2016), which show that the adoption of solar PV was more observed amongst the urban-rich as compared to the resource-poor households. While the need for regular power supply could be argued to be a motivating factor for resource-poor households to adopt a solar PV system, the cost of purchasing and installing it is currently a barrier (Eronini, 2014). For instance, although, the cost of solar panels has decreased over the years ($3.00/watt in 2005 to $0.48/watt in 2015), the current average cost of installing a 4 kilowatts (kW) solar PV system for an average three-bedroom household is about N1.8 million

($9,090) (Renewable Energy World, 2015). While this may be affordable for the rich, this cost may almost be impossible for resource-poor households. This argument is in line with the findings of Ugulu & Aigbavboa (2019), who conducted a study on household Willingness to Pay (WTP) for a hypothetical £16,000 solar home system (5 kW) in Lagos State, and found that, whilst the overall WTP was 49% amongst the medium to high income earners (monthly income between £1,300 - £8,000), it was higher (87%) if there is government aid in the form of subsidies or incentives. While it could be assumed that the percentage of the medium income earners, without the need for subsidies or incentives, should be higher, it could be argued that, as aforementioned, due to other competing spending priorities (e.g. children's school fees, rent, food, water, healthcare, transport and other basic essentials), adoption of solar energy without subsidies or incentives, may be a low priority (see Akintan et al., 2018 and Jewitt et al., 2020, on a similar finding related to the adoption of LPG in Nigeria). This implies that for resource-poor households with a minimum monthly wage of about N20,000 ($55) and poor access to loans, it is almost impossible to achieve, without any form of subsidies or incentives, even if they save half of their wages for 10 years.

In regards to the use of energy-efficient appliances, interviewees stated that this goal may only be partially achieved as adoption is still low amongst resource-poor households. As noted by an environmental NGO staff member (Interviewee 8, NGO, South East) "*for now, we have to be realistic about the use of energy-efficient appliance ...not many can afford them yet ...inefficient appliances will be around for a long time until people can afford them."*

> People are beginning to use low energy bulbs, but a majority of low-income Nigerians cannot afford the cost of energy-efficient technologies. The bulbs alone are very expensive. They cost between N960 - N1200. Many poor people cannot afford it. They will buy the inefficient ones ....Those are like N80 - N120 ...you see the big difference (Interviewee 28, Ministry of Environment, South South)

Similar to existing findings (e.g. Uyigue et al., 2009 and Oyedepo, 2012), interviewees report that, besides behavioural factors, adoption of energy-efficient appliances and energy-efficient practices is still low due to the high cost of energy-efficient appliances, especially amongst the resource-poor. As mentioned in Chapter 1, Nigeria is one of the most socio-economically unequal countries in the world, with about 70 per cent of the population living below the poverty line of $2 per day (AfDB, 2013). As shown in the 2010 national statistics figure, this

represents 51.2 per cent in urban areas and 69.0 per cent in rural areas (AfDB, 2013 and National Bureau of Statistics, 2017). This implies that, over 50 per cent of the population are unable to afford the cost of energy-efficient appliances, which are sometimes more expensive than the inefficient ones. For instance, incandescent light bulbs ranging from N40 to N200 watts are common in Nigeria, and cost between N80 - N120 compared to efficient energy-saving bulbs, which cost between N960 - N1200. Although, the cost of usage over time is cheaper for energy efficient bulb[25] (see Table 5.1), the initial cost is prohibitive for resource-poor consumers. For that reason they turn to the options that are relatively easy to acquire but inefficient and costlier to maintain in the long run (Uyigue et al., 2009 and Oyedepo, 2012).

Table 5.1: Comparison between Traditional Incandescents and LEDs.

	60W Traditional Incandescent	**43W Energy-Saving Incandescent**
Energy $ Saved (%)	-	~25%
Annual Energy Cost	$4.80	$3.50
Bulb Life	1000 hours	1000 to 3000 hours

Source: Authors compilation from Energy.Gov (2020).

These findings on the constraints of unaffordability of low-carbon energy, confirm that access to resources such as income, as identified in the conceptual framework, has an influence on the acceptability and / or sustained adoption of low-carbon energy and energy-efficient practices amongst resource-poor households. Even with the recent plans and progress in rural electrification, and the planned investment to increase the use of low-carbon energy such as LPG amongst resource-poor households, one cannot yet make a definitive forecast that the adoption of low-carbon energy and energy efficient practices will be sustained, without their cost being affordable to resource-poor people, both in rural and urban areas. This implies that the goals to increase the use of low-carbon energy and energy-efficient practices by 2030 could be hampered, and consequently, there could be an increase in energy-related residential GHG emissions. As mentioned in the previous chapters, the use of fuelwood and PHFFG is currently a major environmental challenge in Nigeria (Energy Commission of Nigeria, 2014; EIA, 2016; Department of Climate Change, 2018). This challenge could become worse, if not addressed,

[25]Compared to traditional incandescents, energy-efficient lightbulbs typically use about 25%-80% less energy than traditional incandescents and can last 3-25 times longer. (Energy.Gov, 2020).

as the energy demand and self-generation increase. As shown in Table 5.2, projected electricity demand for 2015, 2020, 2025 and 2030 exceeds the electricity supply by on-grid, off-grid and self-generation combined - 2015 (18019 MW), 2020 (21313 MW), 2025 (30170 MW) and 2030 (45000). The difference in energy demand is significantly in excess of grid supply for the same projected periods - 4219, 10813, 22171 and 40000, respectively.

Table 5.2: Electricity demand and supply projections between 2015 and 2030 (MW).

	2015	**2020**	**2025**	**2030**
Demand (MW)	24380	45490	79798	115674
Supply (including Self generation - captive) [MW]	18019	21313	30170	45000
Supply (without Self generation - captive) [MW]	4219	10813	22171	40000

Source: Authors compilation from the Federal Republic of Nigeria (2016[b]).

The gap between the projected demand and supply indicates that although, as detailed in Chapter 4, Nigeria has developed various energy policies and is making progress in its energy supply, any failure to meet the energy target for 2030 may lead to a drastic increase in the use of fuelwood and PHFFGs and will consequently accelerate energy-related GHG emissions. In effect, this could hinder the actualisation of the low-carbon energy and energy efficiency policy goals including the SE4ALL goals to increase the use of low-carbon cooking energy fuels to 80 per cent of the Nigerian population by 2030, as well as to reduce the use of self-generated power (e.g. the use of small fossil fuel such as PHFFGs) by 2030.

> People will continue to use firewood and generators if they don't have access to energy, either because it is not there or they can't afford it. Even with the pollution, they won't stop, if they don't have a better alternative. They will accept to use it because they need it, but if it is not available or accessible to them, they will continue using inefficient energy .....some people use both efficient and inefficient. (Interviewee 5, Academic Institute, South East)

> Nigeria is burdened by different challenges of climate change mitigation policy implementation, which tend to affect our work on policy enforcement. One of the challenges is the feasibility of some of the policy objectives for the people. Sometimes the resources are not available to implement the policy objectives. Enforcing low-carbon energy measures in Nigeria may pose challenge for the low-income

> citizens because of the poor access to energy and cost.... and many people are on low income. (Interviewee 29, Ministry of Environment, South South)

> If we continue to have this rate of electricity generation, it will not be possible to achieve our NDC goals to reduce energy emissions because in the first place, there is not enough electricity for the masses. So, trying to reduce their alternative means of energy will be very difficult for them and the country. (Survey participant / Interviewee 30 Ministry of Environment, South South)

> Further steps must be taken to implement the policies for the purpose they were developed. We need to know that a lot of people will find alternative ways to provide themselves energy. Already, there is an increase in small generators. Many people are using firewood to cook. (Interviewee 36, Lecturer, South South)

Conversation with interviewees and responses from the survey questionnaires reflect the findings in existing literature (e.g. Ruiz-Mercado et al, 2011; Kumar et al., 2016; Troncosco & da Silva, 2017; Stanistreet et al., 2019), which show that poor accessibility and unavailability of energy could increase resistance to sustained use of low-carbon energy and energy-efficient measures, thereby promoting a reversion to fuelwood, even after efficient energy appliances have been initially accepted. For instance, in 2018 residents of Maiduguri, Borno State, in the northern part of Nigeria, protested against 24-hour supply of electricity to their communities, as they could not afford the cost of regular energy supply (Sahara Reporters, 2018). This signals that poor access to resources including unaffordability of energy, as identified in the conceptual framework, may pose resistance to sustained adoption of low-carbon and energy-efficient practices, the ultimate outcome of which will be failure to achieve the targets of low-carbon energy and energy-efficient practices and, consequently, the implementation of climate change policies by 2030.

Chapter Summary and Conclusion

In this chapter, I presented the findings of the study. Findings on the extent of acceptance and socio-economic constraints upon sustained adoption of low-carbon energy and energy-efficient practices amongst resource-poor households show that, although awareness of them is gradually growing, adoption of low-carbon energy and energy-efficient practices amongst the resource-poor households, in both rural and urban areas is currently very low. These findings

confirm, as outlined in the conceptual framework, that access to resources such as energy and income has an influence on the implementation of environmental management policies amongst the resource-poor population. In effect, the study shows that poor access to resources, unavailability and unaffordability and financial constraints could result in demotivation, infeasibility, and resistance to the sustained adoption of renewable energy and energy-efficient practices and are therefore major socio-economic constraints upon the implementation of climate change mitigation policies in Nigeria.

The findings are based on analysis of the interview transcripts and supported by the reviewed documents. The findings were discussed in relation to the extent that low-carbon energy policies are being implemented and the themes on socio-economic constraints (poor access and unavailability of resources, lack of awareness / information, and feasibility and resistance) that emerged from the data. Data in the first section focused on the extent that the resource-poor households are adopting low-carbon energy and energy-efficient practices, in order to gain an insight on the extent that the energy goals are being implemented. The findings from interviewees revealed that adoption of low-carbon energy and energy-efficient practices amongst the resource-poor households is still currently very low. The other three sections discussed the findings on the socio-economic constraints upon the adoption of low-carbon energy and energy-efficient practices amongst the resource-poor population in the rural and urban areas.

In the second section, interviewees revealed that the acceptability and sustained adoption is constrained by poor accessibility to, and unavailability of, energy resources. Limited LPG cylinders and poor access to LPG bottling plants were found to be major accessibility constraints to the adoption of LPG in the rural areas. Unavailability of LPG, due to scarcity was also found to be a challenge to the acceptance and sustained adoption of LPG in both the rural and urban areas. Poor access to improved cookstoves, due to distribution challenges, is also associated with the low adoption and poor energy-efficient cooking practices, in rural areas. Poor access to hydro-electricity was reported as a constraint to the regular use of electricity for lighting, refrigeration, watching TV, and electric cooking amongst both the rural and urban areas resource-poor households. Poor access to hydro-electricity was reported to be a major constraint to energy efficiency as it promotes the use of PHFFGs, especially in urban areas. Poor access to, and unavailability of LPG were also found to promote the increased use

of firewood amongst the resource-poor households, especially in the rural areas. These findings confirm, as posited in the conceptual framework, that access to, and availability of, resources have influence on public response to environmental management measures in resource-poor communities.

The third section focused on lack of environmental awareness as a barrier upon the acceptability and sustained adoption of low-energy and energy-efficient practices amongst the resource-poor households. Interviewees point out that, although awareness is gradually growing, more is needed to increase the acceptability and sustained adoption of low-carbon energy and energy-efficient practices amongst resource-poor households. One reason for the low awareness amongst the resource-poor people, is found to be partly due to poor access to energy resources. Whilst, the findings on public awareness confirm, as posited in the conceptual framework, the importance of environmental awareness (information) and its influence on the implementation of environmental management measures, it also raises the question of how much impact public awareness will have on the acceptance and sustained adoption of low-carbon energy and energy-efficient practices amongst the resource-poor households, without access to, and affordability of, low-carbon energy and energy-efficient appliances.

The fourth section focused on the feasibility of, and resistance to, low-carbon energy and energy-efficient appliances. Interviewees described the unaffordability of LPG, solar home systems, and other energy-efficient appliances as a major socio-economic constraints upon the acceptability and sustained adoption of low-carbon energy and energy-efficient practices amongst the resource-poor population, both in rural and urban Nigeria. In turn, this could result in resistance, and consequently, increase the use of inefficient energy including firewood and PHFFGs, and energy-related residential GHG emissions. Thereby, hindering the implementation of the goals to increase the use of low-carbon energy and energy-efficient practices by 2030.

In view of these findings in this chapter, I discuss in Chapter 7, the influence of resource accessibility, availability, affordability, and awareness on the sustained adoption of low-carbon energy and energy-efficient practices in the context of resource-poor households.

CHAPTER 6

Socio-economic Constraints in Enforcing Forest Management Policies: Resources, Motivation, Feasibility, Awareness, Acceptability and Resistance

"Forests are like a playground for corruption. A place where the rich companies and corrupt actors take profits to banks and the poor who are asked to manage the forests are left with nothing" (Transparency International, 2013:1).

Introduction

This chapter focuses on the forestry sector as a case study to address the three research questions: 1) To what extent is climate change mitigation policy being implemented in Nigeria? 2) What are the main socio-economic factors that affect Nigeria's implementation of climate change mitigation policies?, and 3) How do these factors pose constraints upon the implementation of Nigeria's climate change mitigation policies? The chapter is divided into three parts. Part One is a review on deforestation and forest management in the context of RDDCs, with reference to Nigeria and its forest management framework. Part Two is an overview of the case study site - Cross River State and the adoption of the Reducing Emissions from Deforestation and Forest Degradation (REDD+) programme in Cross River State. Part Three is an evaluation of the implementation of forest management. Here, I apply the conceptual framework, outlined in Chapter 2, to provide empirical evidence on the influence of resources (i.e. how resources shape the policy implementation) on forest management policies. This includes how poor access to resources (e.g. financial, forest and land resources) and lack of consideration of social safeguards for resource-dependent people in the implementation of forest management policies may adversely affect implementation (i.e. may result to demotivation or resistance to policy implementation). This section is followed by findings on low awareness of deforestation, poor access to information on forest management intervention, and exclusion from forest management decision-making and their influence on the implementation of forest management. The last section presents evidence of land tenure insecurity and financial constraints and how these factors may promote resistance to forest management.

PART ONE

Deforestation and Forest Management Challenges in RDDCs

Deforestation is one of the main contributors to the GHG emissions linked to climate change (van der Werf et al., 2009 and Pendrill et al., 2019). Forest conservation is thus an imperative for the global response to climate change and Sustainable Development Goal 15 (SDG 15) considering that forests absorb vast amounts of carbon dioxide from the air and can store over 75 per cent of the planet's above- and below-ground carbon (Sommerville, 2013). Reducing global CO_2 emissions through tropical forests has been at the forefront of climate change mitigation agenda (IPCC, 1995 and Nabuurs et al., 2007). This is attributable to the pivotal role of forests as a cost-effective climate change mitigation option, and the financial cost of forest management projects in RDDCs is estimated to be significantly lower than in developed countries (Nabuurs et al., 2007). In addition, although tropical forests are major carbon sinks (Pan et al., 2010), the rate of deforestation in the tropical region, particularly in Africa and South America, is projected to be high (Nabuurs et al. 2007).

The accelerating deforestation in RDDCs is driven by environmental, structural, social and economic factors (World Bank, 2008 and United Nations, 2017). This thesis focuses on the socio-economic drivers of deforestation because they also pose constraints to the implementation of forest conservation. Socio-economic factors are major drivers of deforestation, due to the dependence on forests for urban development, agriculture expansion, and fuelwood extraction. Chao (2012) highlights that over 1.6 billion rural people around the world depend on forest resources for livelihoods and sustenance, including smallholder farmers and artisans, for whom forests also present great social, cultural and economic benefits. As detailed in Chapter 1, over 50 per cent of Nigeria's population depend on forests for basic needs including energy (National Bureau of Statistics, 2017). Similar to other RDDCs, the accelerating rate of deforestation in Nigeria is associated with social and economic factors including direct drivers such as the growing demand for land use for agriculture, new settlements, infrastructural development, mining, illegal logging (UN-REDD, 2012 and FAO, 2016). Behind these factors are indirect underlying socio-economic factors (poor funding, need for socio-economic development, high unemployment rate, poverty, poor access to clean and

affordable energy, forest, and land resources), which are linked to land use and illegal logging, and also constrain the implementation of forest management goals (United Nations, 1992). Using Cross River State as a case study, this thesis focuses on some of these indirect socio-economic factors and how they pose constraints on the implementation of forest conservation, with reference to the REDD+ programme in Cross River State.

In addition to playing a critical role in deforestation, socio-economic drivers also present challenges to the implementation of forest management in RDDCs. Critical reviews of the sustainable development and environmental conservation literature question how the goal to drastically reduce deforestation in tropical regions can be achieved (cf. Bensel, 2008 and Agrawal et al., 2011). This question emanates from the socio-economic context (e.g. poverty, high unemployment rate, low income and poor access to resources) of RDDCs, which promote a high dependence on forests resources. As such, whilst there is a growing need for forest management, some sustainable development studies postulate that achieving global forest management objectives and targets to halt deforestation by 2030 are over optimistic and not currently feasible for RDDCs, especially forest-dependent communities faced with challenges of poverty, unemployment and poor access to clean and affordable energy (e.g. Machingura & Lally, 2017). Nigeria is a typical example of tropical RDDCs, with endowment of rich forest resources, but also faced with the accelerating rate of deforestation, socio-economic and forest management challenges (see Chapter 1 for details).

Nigeria's Forest Management Framework

Management of forest regimes (National Parks, Strict Nature Reserves, Forest Reserves, Game and Wildlife Sanctuaries, and Community-managed forests/"free" areas) in Nigeria is carried out at the federal, state, and local levels by various governmental and NGOs agencies as well as forest communities. At the federal level, the Federal Department of Forestry (FDF) is vested with the formulation of the national forest policies, advisory role to the State Department of Forestry (SDF) and supports the execution of projects funded by the federal government and manages relationships with international development agencies (FAO, 2003). Other institutions involved in forestry management at the national level include the Federal Ministry of Environment (FMENV), the Department of Climate Change (DCC), the National Forestry

Development Committee, and the National Council on Environment, as well as the Ministries of Finance, Tourism, Agriculture and Women Affairs. The DCC, formerly the Special Climate Change Unit, is involved in the public awareness campaigns across the country, with special focus on a variety of stakeholders including environmental NGOs, the media, universities, legislators, industries, the business community, community-based organisations and civil society (UN-REDD, 2012). At the State level, the administration of forestry including the management of the timber and wildlife resources, and supervision of revenue generation from states' forestry sector are the responsibility of the SFDs. At the Local Government level, Local Government Area (LGAs) are provided with different roles including the protection of the forests and farm trees from fire and illegal wood felling for farmland, and protecting wildlife against poaching.

The management of the forest regimes by the various government, NGOs and forest communities' agencies have mainly been pursued through the Land Use Acts, 1978. However, this forest law was misappropriated by the military regime's administrators and state governors of timber rich states to allocate forest lands to themselves or for the expansion of state revenue targets. The threats posed by the Land Use Acts to forestry following incompatible levels of policy implementation across the states, prompted the need for a national forest policy in 1988 (FAO, 1996). Still, with the several forest management regimes at the federal, state and local level, as well as various forest management laws and policies, the rate of deforestation in Nigeria remains one of the highest in the world (Federal Ministry of Environment, 2015). The 2015 Global Forest Resources Assessment shows that Nigeria's annual net forest loss is growing at 5 per cent (FAO, 2016b). 5 per cent is the highest rate among the top 10 countries with the highest annual forest cover loss annually between 2010 and 2015 (Table 6.1). This is a major concern for Nigeria's forest conservation and the goal to reduce global warming through forests.

In the bid to address the accelerating level of deforestation and to meets its international obligations to contribute to climate change mitigation, Nigeria reviewed the National Forest Policy 1988 in 2006. The National Forest Policy (2006) goals are aligned with the NCCPRS and NDC climate change mitigation objectives, which both identify the need to promote forest management in Nigeria. As indicated in Nigeria's NDC, halting deforestation and increasingly conserving the remaining forests is important to Nigeria's climate change mitigation goals. The

strategies set in the NDC to achieve deforestation are targeted at supporting the implementation of the National Forest Policy (Federal Ministry of Environment, 2006).

Table 6.1: Top ten countries with the highest annual forest area net loss, 2010 –2015

Country	Annual forest area net loss	
	Area (thousand ha)	Rate (%)
Nigeria	410	5.0
Zimbabwe	312	2.1
Paraguay	325	2.0
Myanmar	546	1.8
Argentina	297	1.1
United Republic of Tanzania	372	0.8
Indonesia	684	0.7
Bolivia	289	0.5
Brazil	984	0.2
Democratic Republic of the Congo	311	0.2

Source: FAO (2016b), adapted.

Beside the NCCPRS and NDC forest management objectives, Nigeria adopted REDD+ programme in 2009 after the Cross River State governor submitted a formal request to the Federal Environment Ministry to make REDD+ a national climate change strategy and also to offer institutional collaboration in 2008 (UN-REDD, 2012). Applying for the REDD+ membership and funding through the federal government was imperative since international REDD+ negotiations are articulated through countries, and without the involvement of the federal government States cannot participate and access funding (Isyaku, 2017). The aim of the REDD+ programme is to start with the State where the majority of high tropical forest cover is located, following which the experience will be replicated in other interested states, upon the availability of additional funding (UN-REDD, 2012). As part of this move, Cross River State was retained as the pioneer, state-level demonstration model because of its engagement in forest conservation, its efforts in bringing the REDD+ mechanism in Nigeria,

and its major potential for GHG emissions reduction from its tropical forests, which is over 50 per cent of Nigeria's tropical forests (Federal Republic of Nigeria, 2013).

The REDD+ Readiness programme followed a two-track approach to advance REDD+ readiness in Nigeria, whereby the development of basic institutional and technical capacities is at the Federal level, and Cross River State is set to carry out intense institutional, strategy-building and demonstration activities. This means that, whilst the Federal government provides the national policy direction for REDD+, Cross River State will inform the national process and guide pragmatically other states interested in REDD+. In 2010-2011, with help from the United Nations Development Programme (UNDP), Nigeria created the first REDD+ coordination and consultation structures both at the Federal level and in Cross River State. During this period, Nigeria also conducted a comprehensive Preliminary Assessment of the REDD+ Context in Nigeria, which set the basis for REDD+ planning. Through the REDD+ programme, a nationwide reforestation programme, that includes the use of indigenous tree species, has been launched to facilitate the growth of forest cover across Nigeria (UN-REDD, 2012).

PART TWO

An Overview of Cross River State, Nigeria

Cross River State is located in the south-south zone of Nigeria and has a population of 3.34 million people. It has a total land area of 21,461.28 km^2, with ecological zones of lowland rainforest, freshwater swamp forest, mangrove vegetation, coastal vegetation, montane vegetation, savannah-like vegetation and wetlands. Cross River State (Figure 6.1) has one of the largest areas of natural forest in Nigeria, with over 50 per cent of Nigeria's remaining tropical forests and 14 forest reserves covering a total area of 2,751 km^2 (Cross River State, 2017).

Similar to other States in Nigeria, Cross River State was largely dependent on oil revenues from the federal government. However, following the cession of the Bakassi Peninsula to Cameroon in 2008, Cross River State lost the right to oil revenues, as it was no longer accounted as an oil-producing State. The loss of oil funds resulted in adverse effects on the

State's economy. For that reason, the State government had to pursue alternative sources of income, and with its offerings of financial incentives, REDD+ was welcomed as an auspicious option to generate income for the forest-rich State (Isyaku, 2017).

Figure 6.1: Territorial map of Nigeria, highlighting the location of Cross River State (CRS).

Source: UN-REDD (2012).

Cross River State's forests contribute significantly to its economy. Prior to losing 50 per cent of its forest cover, the total potential value of tariffs for timber extraction in the State's tropical high forest areas (excluding the Cross River National Park) was estimated to be 5.6 billion naira (US$0.25 billion). In addition to timber production, the State's forests also make socio-economic contribution of NTFPs, such as game, fruits, nuts, plants for foods and medicinal herbs to the livelihoods of the rural people. Income from NTFPs is particularly important for rural communities and poorer households because of the high unemployment rates and lack of opportunities for alternative income generation (Cross River State, 2017).

However, the State is beset by a high level of deforestation and forest degradation. By 2001, 9 out of 14 of its forest reserves had lost over 50 per cent and 3 forest reserves had lost 100 per cent of their forest cover (UN-REDD, 2012). Between 2000-2008, Cross River State has lost

about 17.64 per cent of its total forest cover at an annual rate of 2.2 per cent (Oyebo et al., 2010). Amid the challenges of deforestation, Cross River State has been making some efforts to conserve its forests, over the past 20 years, through different initiatives by the forest-dependent communities, State, and local, national and international NGOs (UN-REDD, 2012).

Under the Cross River State Forestry Commission (CRSFC), several forest management programmes have been initiated in Cross River State. Examples of such programmes are the establishment of a mangrove forest protected area, which was the first in Nigeria, the Afi Mountain Wildlife Sanctuary, and Forest Management Committees (FMC) through which the State formally recognises community forest management. The FMCs have the responsibility for the management of much of the state's community forests and some have played a role in limiting and monitoring logging. There are 45 FMCs which are representing 75 forest communities in forest conservation across the State. Examples of such conservation communities include the Ekuri community, the nine villages around the Mbe Mountains, Iko Esai, Abontakon and villages around the Afi Mountain Wildlife Sanctuary. In addition, international and local NGOs also support the community forest management and conservation initiatives. These different government initiatives, NGOs, and communities' forest conservation efforts provided the platform for the REDD+ Programme in Cross River State (UN-REDD, 2012).

As part of its efforts to address the accelerating rate of deforestation and forest degradation, a Stakeholders Summit on the Environment was organised by the Cross River State government in 2008 to deliberate on carbon forestry and biodiversity conservation. The summit provided a recommendation that the State government should "halt revenue target setting based on timber exploitation and focus on forest conservation and regeneration for possible carbon finance", "declare a two-year moratorium on logging" and "initiate action to take advantage of the carbon credit market" (Cross River State, 2008). This was also seen as a way to facilitate the membership and preparation for REDD+ Programme, which was positioned as a prominent carbon credit mechanism at the time. Thus, following the recommendation from the environmental summit, in 2008, Cross River State declared a two-year moratorium. The moratorium followed the establishment of the Anti-Deforestation Task Force (ATF), an independent unit of the CRSFC, under the supervision of the Office of the Governor, in order to enforce the ban on logging and illegal timber trade all forest types, including Forest

Reserves, Community Forests and open areas (Asiyanbi et al., 2017). Although, the policy was initially a short-term measure for the REDD+ Readiness Phase, the ban on forest use in Cross River State is now indefinite (Cross River State, 2017). Further to the moratorium, the State also removed the high revenue targets from forest exploitation to ensure sustainable forest management and increase carbon stocks in the State (UN-REDD, 2012).

In addition to the moratorium, Cross River State also established other institutional and regulatory structures in the readiness for REDD+ and management of its forests. In 2010, Cross River State enacted a Forestry Commission Law "to make provisions for the establishment of the State Forestry Commission; and for the purposes of providing sustainable management of the forest and wildlife resources, preservation and protection of the ecosystem in Cross River State and other matters connected therewith" (Cross River State, 2010: 1). In regards to sustainable forest management, the CRSFC Law makes provision for two regulatory strategies including the Forest Sector Strategy and Land and Resource Use Plan. The Forest Sector Strategy demands that the State's conservation and sustainable management of forest resources and livelihood for the communities is pursued under the strategy. However, to date, the Forest Law has not yet been enforced for several reasons, which include: 1) the establishment of a multiple and mutually independent institutions such as the Forestry Commission and the ATF, and the Ministry of Climate Change and Forestry, which resulted in a confusion in the forest governance system in the State, 2) the negative impact of the ban on forest-dependent people, who in turn lost interest in forest conservation and, 3) the low capacity of the State to manage the forests (Cross River State, 2017).

In addition to the establishment of regulatory structures, the technical and capacity challenges affecting the forestry sector also had to be addressed. Some of the technical and capacity building structures to support the implementation of REDD+, as documented by the Federal Republic of Nigeria (2017), include:

- The establishment of a REDD+ Coordination Unit at the Cross River State Forestry Commission. This followed the recruitment of national professionals, international-level advisor and technical staff and the strengthening of technical and stakeholder platforms to promote the participation and input of stakeholder in the REDD+ process.

- Training of the CRSFC officials by the UNDP to help gain an understanding of the UN operations for the implementation of the programme and to promote the use of national implementation modalities. In addition, Pilot Site Coordinators were recruited to further strengthen the operations of the CRSFC in facilitating the effective participation of forest-dependent communities across 3 REDD+ Pilot Sites. Other training provided to the CRSFC and stakeholders on REDD+ Readiness issues include environmental finance mechanisms, REDD+ policy and investment actions, social and environmental safeguards, and equitable benefit-sharing schemes.

- A Community Based REDD+ (CBR+) initiative was developed in partnership between the UN-REDD Programme and the Global Environment Facility (GEF) Small Grants Programme (GEF-SGP). The CBR+ programme seeks to provide a platform for local community's active participation in national REDD+ processes. The initiative contributes to the UN-REDD Programme to support countries in the development of REDD+ Readiness with the aim to facilitate early interventions in beneficiary forest-dependent communities (UNDP, 2015). To date, the CBR+ programme has provided grants to 12 civil society organizations for 12 community-based projects in the State. Various capacity building trainings were also conducted to support grassroots organisations, including NGOs and CBOs in designing and implementing projects linked to the REDD+ Readiness process, and for forest-dependent communities to address drivers of deforestation and participate in the REDD+ process (Federal Republic of Nigeria, 2017).

- A forest monitoring system with a functional Geographical Information System (GIS) laboratory and facilities has been established. The facilities have supported the capacity building of stakeholders in the application of remote sensing and GIS for monitoring forest changes, to produce and interpret Activity Data as well as perform multiple benefits mapping.

Following the completion of the REDD+ Readiness Programme in 2016, Cross River State launched a REDD+ Strategy, which seeks to support the State in reducing GHG emissions in an effective, transparent fair, inclusive and sustainable manner (Cross River State, 2017). Some of the forest management measures introduced in the State's REDD+ Strategy include technical solutions such as agroforestry systems, and the need to intensify community participation in forest conservation by developing forest management plans. Such forest

management measures are extended to the existing forest management regimes because they are based on land tenure and land classification, which are some of the challenges of forest management in Nigeria (Federal Republic of Nigeria, 2017). I discuss issues of land tenure insecurity and challenges to forest management in Part Three.

Whilst these technical, institutional and capacity building efforts have been documented in Cross River State, there remains a challenge of how the global goal to halt deforestation will be achieved in practice in RDDCs like Nigeria by 2030. This challenge is due to its social and economic peculiarities including challenging issues of socio-economic needs, lack of funding, poverty, social safeguard issues, inequitable engagement of forest communities and poor access to resources (e.g. income, forest resources and land tenure rights), and how, if not well considered, they may affect forest management. Thus, in preparation for REDD+, a Technical Consultation on Social and Environmental Principles and Criteria was conducted, in 2011, by the Nigerian National Safeguards Working Group (NSWG) to understand the social risks and opportunities linked to REDD+ in Nigeria. This involved consultations and participatory training with stakeholders from government and civil society in Cross River State and at national level.

Amongst the different issues focused on by the NSWG were governance and social safeguards (Federal Republic of Nigeria, 2013). The consultation also followed the development of principles and criteria that interpret the Cancun safeguards in line with the State's specific circumstances (e.g. social, economic and environmental) (Federal Republic of Nigeria, 2017). The governance issues focused on include the participation of forest communities in the REDD+ management structures and the sustainability of the REDD+ mechanism. In regards to social safeguards, the issues focused on include land tenure issues, especially with respect to the inadequacy of current laws to formally recognise community tenure rights, and the need for an equitable benefit-sharing mechanism (Federal Republic of Nigeria, 2013). The governance and social safeguard issues focused on are particularly important because they present major barriers to forest growth and the implementation of forest management in Nigeria. For instance, whilst documents (e.g. Federal Republic of Nigeria, 2013 and Cross River State, 2017) show that efforts have been made to promote equitable stakeholders' participation in decision-making and benefit sharing mechanism, the reality on ground shows that the process is bereft of these equitable considerations and practical social safeguards for

the forest-dependent people (e.g. Isyaku, et al., 2017; Asiyanbi et al., 2019; Krause et al, 2019). I present, in Part Three, a detailed evaluation of the implementation of REDD+ including issues of poor considerations of social safeguard and socio-economic challenges in Cross River State to date.

The practical consideration of social safeguards and socio-economic challenges is important in addressing deforestation and climate change mitigation goals because: 1) lack of funding and the need for socio-economic development are major challenges to forest management in Nigeria, 2) forest communities depend on the forests for their livelihoods, but also play an important role in helping to conserve forests. This implies that the poor consideration of the socio-economic contexts of forest communities could result in increased poverty and a demotivation of their efforts for forest conservation (Federal Ministry of Environment, 2006; Agrawal et al., 2011; Godden & Tehan, 2016). The understanding of socio-economic consideration for the poor is embodied in the revised National Forest Policy (2006), which acknowledges the benefit of forest resources to forest-dependent people and the importance of communities' forest conservation. As such, addressing rural poverty is part of the policy goals to tackle the underlying causes of deforestation, forest degradation and desertification. Some of the objectives of the policy to address deforestation, as documented by the Federal Ministry of Environment (2006), are to:

1. Promote a collaborative forest management partnership with rural communities for the sustainable management of forest resources in and outside forest reserves;
2. Recognise and guarantee the rights of host communities to fair and equitable share of the revenue and participation in resource control and management;
3. Improve the socio-economic well-being of the communities; and
4. Provide income-generating opportunities to communities.

Coincidentally, some of the national objectives reflect the social and environmental safeguard requirements of REDD+ as highlighted in the Cancun Safeguards guidelines points below. Under the REDD+ programme, there are social and environmental safeguards that countries have to promote and support when implementing REDD+ activities to ensure that the implementation of REDD+ activities does not harm people or the environment, but enhances social and environmental conditions. In regards to social benefits and risks, the safeguard

requirements of the UN-REDD are laid out in Decision 1/CP.16 Cancun Safeguards guidelines (UNFCCC, 2010: 26-27), and include that the REDD+ programme in developing countries should:

- Be implemented in the context of sustainable development and reducing poverty, while responding to climate change;
- Ensure that actions are consistent with the conservation of natural forests and biological diversity....., and to enhance other social and environmental benefits, taking into account the need for sustainable livelihoods of indigenous peoples and local communities and their interdependence on forests as reflected in the United Nations Declaration on the Rights of Indigenous Peoples, as well as the International Mother Earth Day;
- Ensure the full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities.

Using the conceptual framework outlined in Chapter 2, I examine, in Part Two, the implementation of the REDD+ programme to date in Cross River State Nigeria, with a focus on the above selected National Forest Policy objectives and UN-REDD safeguards requirements (Cancun Safeguards guidelines). In addition to investigating the extent of implementation, the main goal of the next section is to examine the socio-economic constraints in forest conservation and the implication on climate change mitigation goals. This is followed by findings on low awareness of deforestation, poor access to information on forest management intervention, and exclusion from forest management decision-making and their influence on the implementation of forest management. The last section presents evidence of land tenure insecurity and financial constraints and how these factors may promote resistance to forest management.

PART THREE

Forest Management Constraints: The REDD+ Experience

This case study provides an understanding of the influence of resources, low awareness of deforestation, poor access to information on forest management intervention, and exclusion

from forest management decision-making and their influence on Nigeria's ambitions to address deforestation. In summary, the findings on the extent to which forest management policies are being implemented and the socio-economic constraints upon the implementation of forest conservation show that although, Nigeria has developed relevant policies to pursue its commitment to address deforestation, in practice, similar to energy policies (Chapter 4 and 5), the successful implementation of forest management is complicated by financial constraints and poor access to resources. Even though the vision of the UNFCCC's REDD+ programme is that financial incentives will prevent deforestation and reduce CO_2 emissions, reduce poverty, and improve livelihoods in RDDCs, findings show that there are several socio-economic constraints and safeguard issues that need to be critically addressed in regards to Cross River State's REDD+ programme. More specifically, similar to the barriers of adoption of renewable energy and energy-efficient practices by resource-poor people, three themes emerged from the interview data on forest conservation: 1) Poor access to resources and lack of motivation in forest conservation, 2) Poor access to information and exclusion from decision-making, and 3) Feasibility and resistance.

I discuss the above three constraints in this section in turn. Overall, the implementation of the REDD+ programme in Cross River State to date shows that more needs to be done to promote social safeguards for forest-dependent people to achieve a substantial reduction in the rate of deforestation across Nigeria. For instance, although, the moratorium aims to intensify forest management in the State, forest-dependent communities were forcefully banned from the use of forest resources. This action marginalised the forest-dependent people from benefitting from forest resources and impacted on their livelihood sustenance. The negative impact of the ban on forest-dependent people, could in turn result in low motivation for or resistance to forest conservation.

Poor Access to Resources, Lack of Motivation and Acceptability in Forest Conservation

A major socio-economic constraint upon forest conservation by forest-dependent people is poor access to forest resources and land (Federal Ministry of Environment, 2006). This is particularly the case in Cross River State, where 87 per cent of households living within the

forest communities depend on forest resources for their sustenance (Fadairo et al., 2017). Even though the national policy and the UN-REDD Decision 1/CP.16 Cancun Social Safeguards guidelines highlight the dependence on forest and consideration of access rights and socio-economic benefits for forest-dependent communities, the implementation of the REDD+ programme to date in Nigeria is found to be characterised by scant consideration of these policies' objectives (Ekott, 2016 and Asiyanbi et al., 2019). Similar to existing literature, interviewees reported that deprivation of forest-dependent communities from forest resources, resulting in the loss of income and land tenure insecurity, are disincentives for forest-dependent communities and major constraints upon the implementation of the REDD+ Programme in Nigeria.

Deprivation from Forest Resources

The deprivation of forest-dependent people from forest resources is reported as one of the major challenges in the implementation of the REDD+ programme, which followed a militarised protectionist approach to forest management in Cross River State (Ekott, 2016; Nuesiri, 2017; Asiyanbi et al., 2017; Akanni, 2018). Although, the moratorium was initially a short-term measure for the REDD+ Readiness Phase, the ban on forest use in Cross River State is now indefinite and is reported to have negative impacts on the forest communities as they are deprived of access to forest resources (Cross River State, 2017). This is attested to by my interviewees:

> The protecting of the forest is making life difficult for the poor. This is against the objectives of UNFCCC social safeguards and the sustainable development goals to protect the environment and reduce poverty. In this case, sustainable development in Nigeria is not for the poor. Sustainable development aims to protect the environment and meet the needs of present and future generations, but what is left of the future generations of the poor, if they cannot benefit from present day good? This is not the way to promote climate change. These strict measures will affect the goals of forest management (Interviewee 34, Academic Institute, South South)

> Access to the forest is poor. Many people lost their income due to the ban. Some of them used to get things like chewing stick, bush mango and culinary products from the forests to sell and feed their families. Young people have been taken out of jobs due to the ban. (Interviewee 36, NGO, South South)

> This forest management approach neglects the local circumstances. These people need forests or an alternative source of income to survive. Nigeria has lots of resources, but a majority of the people are poor here. Just conserving trees do not put food on their tables. Especially, as they are marginalised, whilst the forests seem to favour the rich. This will discourage them to conserve the forest. The forest communities do their best to conserve and have been doing so before the ban, yet they have been treated unfairly. Some people were arrested and made to pay fines. They have been deprived from their source of livelihoods. This is a very poorly coordinated, autocratic and unfair approach to reducing deforestation. The ban by the ATF was forcefully enforced and deprived the forest-dependent communities from forest resources ...for the REDD+ programme. The programme has brought despair rather than hope to the poor forest people in Cross River State. (Interviewee 38, NGO, South South)

Similar to existing studies (e.g. Ekott, 2016; Isyaku, 2017; Asiyanbi et al., 2019), interviewees reported that the militarised ban made it difficult for the forest-dependent people to collect forest fruits and food delicacies, fuelwood for energy needs, farm and hunt small game. In addition, local small-scale loggers with clearance for logging matured timber were banned and their timber logs and saw machines were confiscated. Local traders and artisans were negatively affected, and many young people were kept out of employment as a result of the ban. The situation in Cross River State mirrors that of many RDDCs. For instance, restrictive land-use regulation, which led to violation of human rights and forced eviction of forest-dependent people by REDD+ proponents, has been reported in some REDD+ projects in SSA. Barletti and Larson (2017) report that as part of a forest conservation and reforestation programme, the Ogiek forest people in Kenya were evicted in 2014 from the Mau Forest. Also, in the Embobut forest and Cherangany Hills, in Kenya, over 10,000 Sengwer people were evicted from their traditional territories. Although, the World Bank admitted its failure to protect the Sengwer people from eviction in the context of REDD+ readiness, Barletti and colleagues warn that the situation could further worsen if land tenure security, compensation and social impacts are not given critical consideration. Barbier and Tesfaw (2012) reported a similar case of eviction in Zimbabwe, where the government's response to forest protection was to forcefully evict forest people. Dawson et al. (2018) reported on the case of forceful eviction in Mount Elgon National Park, Uganda, in 1993. While the Ugandan government argued its intention was to protect the forest, the mass evictions were followed without compensation of over 10,000 forest-dependent people, leading to conflicts between local communities and authorities. These social impacts issues have raised concerns amongst

environmental and social scholars, and the need for urgent solution to forest management, sustainable access to forest resources and land tenure security. This is important because, although the moratorium and establishment of the ATF in Cross River State was to enforce the ban on logging and illegal timber trade, the militarised ban is perceived as a tactic to exclude the forest communities from land tenure and carbon rights, in order to gain more carbon benefit payments for the State, which seeks desperately to grow its economy (Asiyanbi et al., 2017). This argument is in line with the assertions of Hatcher & Bailey (2011), that REDD+ payments could encourage influential groups or even the government to occupy the forest and threaten forest claims by poor people. I discuss issues of land tenure insecurity and carbon benefits in subsequent sections.

Deprivation of Forest Benefits

While the safeguard requirements of the UN-REDD include that the REDD+ programme in developing countries should: *be implemented in the context of sustainable development and reducing poverty,* the experience from the REDD+ programme in Cross River State, so far, shows that the forest-dependent people have been further made impoverished as they are denied their forest benefits. Further to poor access to forest resources, the forest communities also lost income from forest royalty payments, due to the logging ban (Nuesiri, 2017). As revealed by a governance and social policy lecturer, depriving forest communities from their royalties may impact on forest growth and promote poor demotivation and poor acceptance for conservation:

> The communities' royalty payments have been stopped by the State. This is wrong. This talk about social safeguards ...you really don't see much that benefit the forest communities. They depend on the forests ...you can't introduce forest management and at the same time remove incentives that promote conservation. This does not add up. It will promote deforestation ....the logging will increase ...people won't be encouraged to conserve the forest or help control exploitation of the forest. (Interviewee 7, Academic Institute, South East)

Royalties are payments made to the State governments for timber concessions within forest reserves (FAO & Federal Department of Forestry, 2001). In Cross River State the ratio of royalties between government and communities is 50:50 from forest reserves; 80:20 from forest plantations; and 30:70 from community forests (Amalu et al., 2016). Prior to the forestry ban, about 70 per cent of revenue from logged timbers sourced from communal forests was

paid to the communities (Nuesiri, 2017). The royalty payments have been used by some communities for various developmental projects including building bridges, schools, health centres, market stalls, postal agencies, construction of roads, and drilling boreholes, as well as for the award of scholarships to indigenes for higher education (Amalu et al., 2016). However, the loss of these benefits poses challenges to such communities' development and may further deepen the poverty gap, and consequently result in illegal logging. This is consistent with existing assertions that, faced with poor access to forest income, forest communities often lose interest, may not accept forest management interventions and / or resist forest conservation. For instance, unemployed youths and community leaders seeking to earn a living are often lured into illegal logging by timber merchants (Ikuomola et al., 2016). Communities and their chiefs are also reported to increasingly collude with illegal loggers and hunters because they consider forests reserves as land that has been taken from them, and they are not motivated to protect the forests without incentives or ties to the forests. The financial gains from illegal logging are more enticing, as they get more money from illegal loggers than the royalties, if the latter are not paid (Caldecott & Morakinyo, 1996 and FAO & Federal Department of Forestry, 2001). These findings also agree with the observations of Isyaku (2017) that, while the forest communities have always practiced conservation, they are motivated to protect the forest if they benefit from it. The lack of incentives to conserve and poor access to the forests have caused frustration amongst many, who are also posing resistance to forest management and making threats of forest destruction in the absence of compensation or forest incentives. Furthermore, these findings confirm, as proposed in the conceptual framework, that poor access to resources has a negative effect on environmental management in resource-poor communities. As noted by some social and environmental advocates and representatives:

> Poor access to forest resources is a major challenge to forest management in Nigeria. You can have various measures to protect the forest and still experience deforestation, if there are no incentives for the poor to protect the forest. This may be a challenge to the REDD+ programme because of the poverty and restricted access to the forest. Youth unemployment is high here and if you don't give people access to land and NTFPs, for example, they will not be motivated to conserve the forest. Banning people from the forest adds to their poverty and such restricted access may not work for REDD+. (Interviewee 10, NGO, South East)

> Community forest conservation is important to reduce the challenges of deforestation in Nigeria, but we also must look at the social aspects. We need to ensure that those needed to contribute to management of the forests are not at disadvantage. (Participant Observation / Interviewee 11, NGO, South East)

> Climate change is a global threat, ...it is a dilemma for the poor, ...it is not only an environmental issue, but also a major social problem. Poor consideration of poverty, of social safeguards in mitigation interventions widens the poverty gap. ...The poor suffers more. They want to protect the planet [and conserve the forest] but not on empty stomach. (Interviewee 21, NGO, South West)

Statements from the survey questionnaire, participant observation and interviewees imply that, whilst the REDD+ programme is welcomed as a global tool to address deforestation in Nigeria, the negative impacts experienced in Cross River State's forest management intervention, in effect, creates disincentives for forest conservation by forest communities and a challenge to the success of REDD+ in Nigeria.

Furthermore, the deprivation of the forest-dependent communities in Cross River State from forest resources also conflicts with the National Forest Policy objective to *create improvement in the socio-economic well-being of the communities, and* the UN-REDD social safeguards requirement to: *reduce poverty and enhance social benefits by taking into account the need for sustainable livelihoods ensuring of indigenous peoples and local communities and their interdependence on forests*. Interviewees argued that the national policy and safeguards requirement appear to be rhetorical rather than practical, as prior social welfare provisions were not made by the State for the forest-dependent people before the ban. As noted by interviewees:

> People are affected by the ban. The forest is their home and the have lived and depended on it for many years. There was no provision made for them. There should have been proper social safeguards in place to support them. (Survey participant / Interviewee 9, NGO, South East)

> A lot of people are affected. There is no job or income coming in. Some are even in debt. Many of them may not be interested in the conservation of the forest with this ...the motivation is not there. Where is the incentive for that? Poverty is a disincentive for forest management. We don't have social welfare system in Nigeria ...the forest is what they depend on here. Cross River State didn't compensate the people. It will cost a lot of money. Maybe they don't have that money. No more oil revenue coming from the government. (Interviewee 18, Academic Institute, South West)

> We are trying to reduce deforestation without practical consideration for the forest people. These safeguard guidelines are just on paper. There is no alternative source of livelihood for these people. Alternative measures and compensation should have been put in place before the ban. (Participant observation / Interviewee 37, NGO, South South)

> The livelihoods of the poor people were not considered. It is in the policy, but it is not done in practice. Agreed, the State may lack the financial capacity to do so, but this could have been factored into the finances from the international community for the readiness phase. You can't build capacity to reduce deforestation in a poor country and not address poverty. (Interviewee 38, NGO, South South)

These responses from survey questionnaire, participant observation and interviewees align with the argument of Chhatre et al. (2012), that the REDD+ programme may affect the livelihood of local communities, as they are likely to be forced out of activities that give them their livelihood, without any prior compensation. This is challenging for the forest communities because, as detailed in Chapter 1, Nigeria is rated among the poorest countries in the world with poor access to basic needs including good healthcare, housing, electricity and food provisions (AfDB, 2013 and Ngbea & Achunike, 2014). In addition to poor access to basic needs is also the high rate of unemployment. As such, a majority of Nigeria's population including rural communities and poorer households in Cross River State depend on forests for income and basic needs (Cross River State, 2017 and National Bureau of Statistics, 2017).

Interviewees argued that the lack of compensation for the forest-dependent people prior to the ban could be due to the State's financial inadequacies after the loss of oil funds. As such, the State government had to pursue alternative sources of income, and with its offerings of financial incentives, REDD+ was welcomed as an auspicious option to generate income for the forest-rich State (Isyaku, 2017). Although, since the commencement of the Nigeria's REDD+ Readiness Programme in 2013 (approved by the UN-REDD in 2012), Nigeria received financial readiness grant of US$ 4 million from the UN-REDD, US$ 3.6 million from the World Bank's Forest Carbon Partnership Facility (FCPF), and other financial and technical support from the Governors' Climate and Forest Task Force (California), these financial transfers were committed to financing the preliminary REDD+ processes and building the capacity to attract more climate finance (Federal Republic of Nigeria, 2013), (see Appendix 6) and not meant for compensating or supporting the livelihoods of the forest dwelling communities (Ekott, 2016). However, interviewees' responses suggest that, while it is

necessary to build capacity, the poor consideration of poverty and compensation for the forest communities, as well as poor access to resources, may serve to demotivate the forest-dependent people and raises the question on the realisation of the goal to reduce deforestation.

Low Awareness, Poor Access to Information, Exclusion and Resistance

Low awareness of deforestation, poor access to information on forest management intervention, and exclusion from forest management decision-making were found to be constraints upon the implementation of forest management. A general consensus of the existing literature (e.g. Latham, 2013; Mfon et al., 2014; Mba, 2018) is that low education level, including awareness of the importance of environmental protection, is a challenge to forest conservation. As such public awareness campaigns have often been one of the remedies proposed for forest deforestation in RDDCs. For instance, one of the policy measures to address deforestation in Nigeria, as documented in its National Forest Policy (2006) is to: *increase awareness campaigns on effects of deforestation, and sustainable forest management.* However, whilst, the need to create awareness of deforestation and forest conservation remains, evidence from this thesis shows that public awareness could only meet its desired outcomes with practical actions to reduce poverty, promote access to adequate resources and participation in forest management decision-making, as well as effectively communicating forest measures to affected people.

> Raising awareness is necessary. We also need to ensure the people's livelihoods are protected. They depend on the forests. If their livelihoods are affected, awareness may not do much to protect the forests. (Survey Participant / Interviewee 11, NGO, South East)

> There are NGOs who are educating communities to promote conservation. Awareness is being raised to ensure sustainable use of forests in Cross River State. Awareness needs to be raised. But, what can we achieve with this, if people are aware, but can't participate in conservation? Awareness is productive, if followed with practical actions ...practical actions to encourage people to conserve is very important to reduce deforestation. (Interviewee 20, Academic Institute, South West)

> You don't just think people will not conserve the forests because they are not educated, or aware of the consequences of deforestation. Forest conservation has been a part of the forest communities, but deforestation is still a problem ....it is good to create awareness. But, some people may not conserve, not just because they are not aware, but because they are not encouraged with the incentives to

> conserve ....environmental protection is not only about awareness. Social impacts of interventions and the socio-economic challenges of the poor need to be considered. Interventions need to be supported by communities. Sometimes I think degradation is not only because of low awareness of environmental issues. Awareness is being raised, but this should not be all we do. If you affect people's livelihood, and exclude them from information and decisions, which affect their forests and, forest benefits, then awareness will not do much. (Interviewee 39, NGO, South South)

Interviewees confirmed the importance of raising environmental awareness and that various NGOs have been active in raising awareness of forest degradation and deforestation, and sustainable forest management in Cross River State. For example, the Wildlife Conservation Society has been working with some of the communities around the Afi River Forest Reserve, the Mbe Mountains and the Okwangwo Division of Cross River National Park for over a decade (Federal Republic of Nigeria, 2013). Another notable NGO is the Ekuri Initiative, which has been active in raising awareness and conducting conservation activities with community members of the Old and New Ekuri and neighbouring communities of Okokori, Etara, Eyeyeng, Owai, and Mfaminyin. The NGO is also involved in sustainable forest management, community development, and poverty reduction initiatives, especially for the most vulnerable and economically marginalised members of the forests communities (UNDP, 2012). This model of community forest management, which practically considers the poor members of the forest communities can be argued to be productive in the Ekuri's forest conservation initiative. For instance, the Ekuri community has participated in conserving over 33,000 ha of community forest (UN-REDD, 2012). The Ekuri NGO's pro-poor innovative sustainable community forestry activities has received global recognition such as the UNDP Equator Award in 2004 because 'it works for human and nature'. This international recognition further placed Ekuri community as the most successful example of community-based forestry in West African sub-region and has earned the NGO more support and international funding to replicate the model in other neighbouring communities and other parts of Cross River State (Isyaku, 2017).

However, in similar vein to reports in the existing literature, interviewees argued that the focus on increasing awareness campaigns on deforestation and sustainable forest management, while it is important, seems to sometimes ignore the contribution and engagement of forest communities in the conservation of forests (Isyaku, 2017 and Duchelle et al. 2018). Particularly, this focus ignores the socio-economic challenges of the forest-dependent people

and the reason for their dependency on forests (poverty and poor access to resources), and the need for livelihood sustenance including food, energy, herbs and income. Rather than pay attention to the practical constraints of the rural poor, it reinforces the common narrative of deforestation in Africa which often apportions blames for deforestation to the rural poor because of their use of forests, and low level of education, which in existing literature (e.g. Latham, 2013; Mfon et al., 2014; Mba, 2018) is often associated with lack of environmental awareness, and is alleged to present a major risk of failure to the successful implementation of environmental interventions.

Narrative is a common approach strongly used in persuading and generating meaning to physical and social realities (Hajer, 1997). For instance, Hajer (1997) argues that the presentation of modern-day environmental issues and how they are perceived by societies and institutions is dependent on the narratives that is given about the problems. Often, high urgency for environmental solutions is given to the problems through an apocalyptic narrative as they are placed into policies. Other scholars also portray narrative as a powerful tool, often used to justify and promote environmental management interventions and actions (e.g. Jones & McBeth, 2010). However, Arhin (2017) warns that environmental policies and projects based on the blame narratives and assumptions are often misguided and divert attention from other forces (e.g. social and economic) of environmental degradation, which are pertinent for environmental protection and restoration. As seen in the case of Cross River State, such narratives, which are targeted at rural people including forest communities, resulted in a strict protectionist approach to forest management, and are argued to be a challenge and potential failure to the implementation of REDD+ (Isyaku, 2017; Asiyanbi et al., 2019; Krause et al, 2019). These findings are in line with that of Arhin (2017), who draws attention to the application of such narratives of deforestation in the REDD+ programme in Ghana and the potential consequences this may have on the implementation of REDD+. This implies that, while actions to reduce deforestation can be shaped by narratives which promote the need for increased environmental awareness and draconian approaches, this approach may not achieve success in all contexts, especially those faced with social and economic challenges including poverty and marginalisation, and where practical social safeguards considerations, access to information, and the inclusion of forest communities in policy decision-making are ignored.

Interviewees' responses indicate that while lack of environmental awareness contributes, it is not the major challenge to deforestation in the context of Nigeria. Interviewees argued that poor access to information and exclusion of forest communities from policy decision-making also pose challenges to the implementation of forest management measures. For instance, evidence from previous investigations (e.g. Asiyanbi, 2016; Isyaku, 2017; Nuesiri, 2017) confirms that the REDD+ and state forestry actors failed to provide adequate information and effectively communicate to the forest people about how the projects works including the carbon benefit payments. As also reported by interviewees:

> Even though they have been involved in managing the forest, the majority of the people don't understand this REDD+ project. They are uncertain about the future of the benefits and payments. Part of the challenge stems from the lack of transparency, poor communication and participation in the project meetings. The project actors failed to effectively communicate the programme to them. (Interviewee 34, Academic Institute, South South)

> There are many people involved in the process and these are not the affected people ...engagement with the forest communities is poor. They are not fully involved in the decision-making of this programme. They are excluded from the meetings ...the affected people are not well represented. Everyone wants to bite from the carbon benefit pie, but they are not the ones affected. Those whose livelihoods are affected should be able to participate in the REDD+ process and decision-making and not be treated like they don't have any say. They have a say about their forests and welfare. Their involvement in decision-making and adequate information about payments will be an advantage to forest conservation here. (Interviewee 36, NGO, South South)

The responses from interviewees suggest that, although the UN-REDD recommended indicated the equitable and active involvement of affected populations in the design and implementation of REDD+ plans (UN-REDD, 2008), there is a disparity between what is on paper and what is on the ground. These findings are in agreement with the observations of Isyaku (2017), that prior information about the REDD+ readiness process was not provided to the forest communities as claimed by the project proponents. Members of the forest communities and elected representatives were excluded from the REDD+ consultations, and represented by non-elected elites, who passed poor information and were not transparent about the decisions taken on behalf of the communities. Where communities' representatives were present, only the clan heads were permitted to ask questions regarding the formation and operations of the programme including the ATF. This meant that the information about

REDD+ and the ATF was not clearly delivered in a language that is accessible to everyone, as all discussion was in English and this was a barrier to the clan heads, who are mostly uneducated elderly people and hardly understand or communicate in English language. As also argued by interviewees, poor access to adequate information and exclusion from decision-making meant that the forest communities could not get the relevant information about the ban, social impacts of the REDD+ programme and its benefits scheme. This situation has provoked suspicions about the benefits of the REDD+ programme, and uncertainty about land tenure rights and carbon credit benefits in Cross River State. The suspicion is that, as with the militarised forests ban, forest communities were excluded from the REDD+ decision-making meetings to create more carbon benefits for the State.

> The communication about the programme and its benefit sharing is unclear. The communities were excluded from participating in the policy design and consultation meetings and were poorly represented. The forest communities are not happy about this ...many believe this was a deliberate action to exclude them from the carbon credit benefits and conceal any risks of the project in their forests. The people are complaining of being marginalised. Members of the communities say the government is collecting their lands for REDD+, so that they alone can claim the benefits. The people are not sure about their rights to land and carbon. (Interviewee 27, Ministry of Environment, South South)

These findings are in line with previous evidence (Asiyanbi, 2016; Ekott, 2016; Isyaku, 2017) that the marginalisation of forest communities and their elected representatives in the Nigerian REDD+ cast doubts about property rights and future carbon payments. Especially as the REDD+ proposals in Nigeria have linked carbon rights to forest and land rights in line with the National Forest Policy (2006) which is based on the Land Use Act (1978), whereby all land is owned by the state government (UN-REDD, 2012). Although, the revised Cross River State Forestry Commission Law recognises customary land claims, the State has the power over all forests. However, with this condition of land ownership also come the challenges to land and carbon rights (Asiyanbi et al., 2017). And as evidenced in this thesis, the State's power over land creates much anxiety for the forest-dependent people because it gives the State more advantage in terms of carbon rights, which also implies that the government has the carbon benefits payments. This explains, as argued by Isyaku (2017), why the carbon rights are not defined by the REDD+ proponents in Cross River State - because carbon ownership places legal ownership of forest land on individuals and communities. Sharing carbon rights and

benefits with forest communities puts the government's ambition to expand the state's revenue sources from carbon forestry at risk and could affect its motivation to protect the forests for REDD+. This perhaps also explains, as previously mentioned, the need for the protectionist approach to exclude the forest communities from the use of forests. On the other hand, the poor access to information and exclusion of the forest communities contradicts the Cancun Safeguards guidelines to: *ensure the full and effective participation of relevant stakeholders, in particular, indigenous peoples and local communities.* Consequently, this may provoke resistance and poor commitment to conservation, and negatively impact on the implementation of REDD+.

> Not having proper information and being excluded from decisions about their forests and welfare do not help matters ...this will not motivate them to conserve ...this could cause resistance to conservation and the programme. The marginalisation and suspicions about the programme. If they are not sure of what will happen about the carbon payments, they may be reluctant to support conservation. (Interviewee 38, NGO, South South)

Findings from this section support the argument, as posited in the conceptual framework, that information can influence the implementation of environmental management measures. In this case, poor access to relevant information can jeopardise the implementation of such measures. These findings are also in line with the arguments of Larson & Petkova (2011) and Isyaku et al. (2017) that communicating the right information and the participation of all actors in the REDD+ decision-making process are crucial to promoting the motivation and commitment of forest communities in forest conservation programmes.

Land Tenure Insecurity, Financial Constraints, Feasibility and Resistance

This section provides evidence on the issues of resistance to forest management and conservation in Nigeria. In addition to poor access to forest use and information, land tenure[26] insecurity and lack of financial resources were reported as major socio-economic constraints upon the implementation of forest conservation and the REDD+ programme.

[26] Land tenure is the right that determines access to resources for individuals or communities, access to use and manage how the resources are used, the duration and under what conditions they are used, the person or community entitled to transfer the tenure rights to others and how the rights are transferred (Larson & Springer, 2016).

Land Tenure Insecurity, Feasibility and Resistance

Evidence from this study shows that resistance could also arise from poor access to land resources. The marginalisation of the forest communities from forest resources in Cross River State further highlights the issues of land tenure insecurity, which conflicts with the national policy objectives to: *recognise and guarantee the rights of host communities to fair and equitable share of the revenue and participation in resource control and management*. It also conflicts with the Cancun Agreement safeguards requirements. The Cancun Agreement, under the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP) safeguards provisions of Article 26 (2007), declare that: "(1) Indigenous peoples have the right to the lands, territories and resources which they have traditionally owned, occupied or otherwise used or acquired, (2) Indigenous peoples have the right to own, use, develop and control the lands, territories and resources that they possess by reason of traditional ownership or other traditional occupation or use, as well as those which they have otherwise acquired, (3) States shall give legal recognition and protection to these lands, territories and resources. Such recognition shall be conducted with due respect to the customs, traditions and land tenure systems of the indigenous peoples concerned" (United Nations, 2008: 10). However, this is not the case in Nigeria, where the land laws do not formally recognise community land tenure rights (UN-REDD, 2012).

> Land belongs to the government. The government does not recognise community land in Nigeria. This creates insecurity. People are marginalised in their own land; the law does not protect their land. Communities do not have rights to land. (Participant survey / Interviewee 11, NGO, South East)

> Land insecurity is a major problem in Nigeria. Land rights can be revoked at anytime …land insecurity ...this may affect the REDD+ project because marginalised people may not be interested to conserve without incentives to forest resources. The marginalisation of forest people and the increasing need for economic development, void of social safeguards considerations, is also promoting insecurity about land tenure, and could promote resistance to forest conservation. (Interviewee 22, NGO, South West)

Similar to existing studies (e.g. FAO & Federal Department of Forestry, 2001; USAID, 2010; Makatala, 2016), interviewees and survey participants stated that failure to recognise land tenure right in Nigeria is partly due to the gaps in the implementation of the Land Use Act (1978). Prior to the promulgation of the Land Act (1978), different forms of customary land

tenure arrangements, whereby individuals and families had rights to family and communal lands, were practiced in Nigeria (USAID, 2010). During this time, land in Northern Nigeria was governed by the Nigerian Land Tenure Law 1962, under which lands in the region were controlled by the Governor and held for the use and common benefit of the northern indigenes. Under this regime, customary tenure rights were administered by traditional authorities including communities or their leaders, whilst statutory tenure rights were administered by State governments. A varied system which allowed control to be in the hands of families, clans, villages and communities was practiced in the Southern region of the country (Obayelu, 2014). However, the customary tenure system practiced in both regions created difficulties for the government to acquire land for development purposes. As a result, the Federal Government promulgated the Land Use Act (1978), which overrules any customary claims to land (Isyaku, 2017).

Under the law all lands are held in trust for the people by the State Governors. In this case, land is to be accessible to all Nigerians, but also provides both federal and State governments with the power to acquire lands for development purposes (Isyaku, 2017). The power of the state over land, however, generates insecurity and concerns about land tenure among citizens, especially as obtaining large parcels of lands for development or economic purposes also involves consolidating smaller parcels of land from individual landowners, families or broader segments of the local communities (Makatala, 2016). Consequently, forest communities are restricted in their access to forest resources and are unable to secure land tenure rights as their statutory and customary rights to land are revoked by the State (Isyaku, 2017). In line with previous findings, interviewees reported the failure of the state to recognise land tenure rights and issues of marginalisation.

> When the government needs the land for development, then the communities do not have the right to challenge it. They are evicted without compensation and the rights to land is revoked. The State holds land in trust ....it has the power to acquire land ...keeping land in trust does not automatically give people the formal right to the land ...it is a disincentive to forest conservation. The land insecurity does not promote support for conservation. Not many people will conserve the forests without some form of incentives. (Interviewee 33, Academic Institute, South South)

The power to acquire lands for development or economic purposes, resulting in marginalisation of forest-dependent communities and land tenure insecurity, can be seen in the Superhighway project and REDD+ programme in Cross River State.

> The need for economic development is promoting the allocation of large parcels of land. Some people complain that even more concessions are being granted to private investors, but the communities don't have the same opportunities. There is the issue of the superhighway now. There was no proper EIA before they started the process. To construct the superhighway, the government decided to revoke the communities' rights to land, so that they can have more lands. The people are not considered. They [the government] don't care about them. The money comes first. It's all for economic gain. The state is broke. The government is desperate. (Interviewee 54, NGO, North).

In line with the findings of Isyaku (2017), interviewees argued that the need of the State to expand its revenue base, after the loss of revenue from oil funds, prompted the construction of the Superhighway, a 6-lane 260km dual-carriage road network from Cross River State in the south to Katsina-Ala in Benue State, in the north of Nigeria. It is reported that the project commenced without a proper Environmental Impact Assessment (Heinrich Boll Stiftung, 2016 and Affe, 2018), with lands being acquired without due public consultation or consideration for the livelihood of the local people (Isyaku, 2017 and Asiyanbi et al., 2019). The project, which cuts right through the middle of the State's rainforests and forestland belonging to over 40 communities, prompted the revocation of the communities' land rights by the State (Guardian, 2016). The total area seized by the state amounts to about 5,200 sq km (25%) of the state's total area. This meant over 185 communities within the affected land area were subjected to loss of access to their land, displacement and loss of livelihood. The clearing of the forest commenced less than four weeks after a six weeks period following Notice of Revocation of Rights of Occupancy for Public Purpose Land Use Act 1987, published by the Government of Cross River, was issued and was being contested by the public (Heinrich Boll Stiftung, 2016).

The revocation of communities' rights and urgency to commence construction of the superhighway, and poor consideration of livelihoods could be argued to be the result of the desperation of the state to develop its economy following its financial challenges after the loss of oil funds. A similar case of eviction for the purpose of development is reported in Ghana, where thousands of residents of Agbogbloshie / Old Fadama settlement in Accra, were evicted

by the Accra Metropolitan Authority because the land was needed to create access for the Korle Lagoon Environmental Restoration Project (Ocheje, 2007). In South Africa, 942,303 farm dwellers were evicted and over 2 million displaced for the purpose of development between 1994 and 2004 (Wegerif et al., 2005). The land revocation in Cross River State also reflects the dependence on natural resources for economic development and feasibility constraints upon forest management. It further strengthens the evidence of the assertions concerning poor tenure rights in Nigeria (Asiyanbi, 2016 and Isyaku, 2017) and other RDDCs (Wegerif et al., 2005; Ocheje, 2007; Hatcher & Bailey, 2011 Angelsen et al., 2012) - a challenge which needs to be addressed in order to promote support for forest conservation.

In addition to the dependence on natural resources for economic growth, this thesis found that the need for economic development conflicts with the desire to reduce deforestation. The superhighway, for instance, is rated as a controversial project because whilst the state is claimed to be active in the REDD+ programme, it is argued that it will also further cause deforestation through the construction of the superhighway. This may hinder the accumulation of carbon in the state's forests and benefit payment to alleviate poverty for the forest-dependent people, whose livelihood have been affected (Asiyanbi, 2016 and Isyaku, 2017). For instance, there is uncertainty about the small amount of carbon that may only be accumulated at the end of the maturation period as deforestation continues.

> At the end of all these troubles, I do not think there will be any benefit for these poor people, who have committed to managing communities' forest and suffering an unnecessary ban ridding them of their livelihood sustenance. There may not be much carbon credits to share anyway as long as the deforestation continues. (Interviewee 33, Academic Institute, South South)

> The superhighway will create income for the state, but at the same time, it places much burden on the poor. The forest-dependent people may not gain from this. That is why communities don't want the project. It may impact on the REDD+ carbon credit. The amount of carbon may be affected. It is a dilemma for the state. It is not easy to fully commit to REDD+. The state needs the money from REDD+ ...it also needs the revenue from the superhighway. (Interviewee 36, NGO, South South)

Echoing previous studies (e.g. Asiyanbi, 2016), interviewees argued that it is not certain if the amount of carbon that will be accrued will be commensurate to the loss of income and source

of livelihoods from the ban and years of waiting for carbon maturation period. The carbon benefits maturation period is particularly argued to have a negative social impacts on forest-dependent people's welfare. Although, the maturation period was stipulated to be about an average of 4-5 years, since the ban on forest use in 2008, it is reported that no payment has been made to the forest-dependent people (Asiyanbi et al., 2019).

> Whenever I meet some of the community people, they do not stop lamenting about the ban. What members of the forest communities keep saying is that they were better off. Most of the people were farming and engaged in petty sales of forest fruits before the ban. Now all they are left with is hope ....waiting for the benefits from REDD+, which they have not seen and don't know if they will ever get. Even if it comes, it may take years and only God knows what then. I think REDD+ is creating more poverty and despair not hope for these people. It is a poverty trap. Logging and land-use are still going on. How much carbon credit can they get from deforestation? (Interviewee 39, NGO, South South)

Interviewees' responses echo previous arguments (e.g. Nuesiri, 2017; Asiyanbi et al., 2017; Akanni, 2018) that the goal of Nigeria's REDD+ programme to "*enable the country to contribute to climate change mitigation through improved forest conservation and enhanced sustainable community livelihoods*" (UN-REDD, 2011: 2), may turn out to be symbolic, as its purpose of forest conservation and poverty alleviation is not being served. Interviewees argued that while the rich stakeholders can afford to wait for the maturation of the project, the poor forest-dependent people cannot afford to wait that long.

> The rich stakeholders may not mind waiting because their livelihood is not affected in the meantime as [is that of] the forest-dependent people. What if the project does not earn enough or even meet the criteria for carbon credits in the future? These politicians are just putting the livelihoods of these poor people at risk out of their selfish interests. (Interviewee 38, NGO, South South)

Although, the superhighway project in Cross River State is currently put on hold by the Federal government, there are fears it may commence at any time soon, and poses questions of how much the state is truly concerned about deforestation and forest management. Moreover, the land revocation in Cross River State, which highlights poor considerations of land tenure rights and livelihoods could also promote resistance to conservation. Evidence from this study supports previous studies that land tenure insecurity poses concerns for the successful implementation of the REDD+ programme in Nigeria (e.g. Asiyanbi et al., 2017 and Akanni, 2018). Similar situations are also reported in other RDDCs. For example, Beymer-Farris &

Basset (2012) reported a similar case of resistance by forest communities in rural Tanzania, as their community-based resource management has been replaced with a new form of forest management - fortress conservation. Beymer-Farris and Basset argued that proponents underestimated the agency of forest-dependent communities who have played a major role in shaping the delta landscape, and who will resist every injustice they are facing as a result of their loss of rights to the forest.

Financial Constraints, Feasibility and Resistance

In addition to poor access to forest resources and land insecurity, financial constraints, leading to the poor funding of the forestry sector are found to affect the morale of poorly paid forestry officials and conservation of forest regimes, especially at the State and LGA levels. As reported by survey participants and interviewees *"the forestry sector is poorly funded in Nigeria. This leads to low staff morale and low capacity of the workforce"* (Survey participant / Interviewee 19, Academic Institute, South West).

> The forest sector is poorly managed and funded. Where staff are not paid for months and the sector is not well funded to build the capacity of staff, you cannot guarantee their morale to manage the forest. (Survey Participant / Interviewee 2, Min. of Environment, South East)

> Deforestation is greatly affecting our forests and there have been different programmes to manage the forests, including the community-managed programmes. Part of the reason we have not recorded much success is because of the low capacity (training, technology, funding) of the forestry agencies to enforce forest policies, due to poor funding of the sector. (Interviewee 6, University Lecturer, South East)

Interviewees' testimony to financial constraints and impact on forest management is similar to those reported by the FAO & Federal Department of Forestry (2001) and UN-REDD (2012), which show that the forestry sector is not sufficiently funded from national and State budgets. As reported by the FAO & Federal Department of Forestry (2001), the Department of Forestry in some States get as little as 1 per cent of the total budget. A recurring consequence of the lack of funding and revenue allocation between federal and state governments is the rampant illegal logging by commercial merchants, aided by forestry officials, who often do not get paid for several months, and who thus lose the motivation to conduct their duties efficiently and so

collude with illegal loggers, due to their lack of income (Caldecott & Morakinyo, 1996; Asiyanbi, 2016; Matakala, 2016; Fadairo et al., 2017). For instance, even after the militarised ban was implemented to reduce illegal logging and strict enforcement on forest use was delivered by the ATF against the forest-dependent people, Cross River State (2017) confirms that the rate of deforestation increased between 2007 and 2014 (Table 6.2). The increase in deforestation was linked mostly to unsustainable practices of deforestation carried out by poorly paid, corrupt forestry actors and large corporations (Asiyanbi, 2016 and Ekott, 2016).

Table 6.2: Forest Cover in Cross River State from 1978 to 2014.

Year	Forest Cover (ha)
1978	968,200
1995	842,000
2000	849,485
2002	772,961
2007	809,578
2014	642,195

Source: Cross River State (2017).

These findings highlight the argument by Climate Alliance (2016), that a major challenge in reducing forest emissions is that REDD+ cannot compete with the huge profit from illegal forests activities in RDDCs. It is estimated that over US$10 billion assets and revenue is lost to illegal logging annually (World Bank, 2008). As seen in Nigeria, poorly paid and corrupt forestry officials are found to contribute to large scale illegal logging for economic benefits by conniving with timber merchants (UN-REDD, 2012; Asiyanbi, 2016; Matakala, 2016; Fadairo et al., 2017). For instance, in response to the illegal logging acts and deforestation in the State, the then state Governor argued that, confronted with the temptation of huge bribes from corporations, which is so much money that it can corrupt anyone, it is almost impossible for the forestry commission to manage forests sustainably even within the framework of REDD+ (Ekott, 2016). That said, it could be argued that, although corrupt forestry staff have been

found to be involved in illegal logging (Asiyanbi, 2016; Matakala, 2016; Fadairo et al., 2017), the temptation to collect bribes and participate in illegal logging is also due to underlying socio-economic factors such as lack of income of forestry officials, due to financial constraints of the forestry sector, which may make it less feasible for them to promote forest conservation (Caldecott & Morakinyo, 1996; Asiyanbi, 2016; Matakala, 2016; Fadairo et al., 2017).

Financial and feasibility constraints, and resistance to forest management can also be seen in the implementation of the REDD+ programme in the Cross River State. For instance, it was reported that the former State Governor, Mr Liyel Imoke, who facilitated the adoption of REDD+ in 2008, to reduce deforestation and boost the State's economy through carbon forestry, later showed resistance to the programme in 2015. Mr Imoke voiced his frustration that the programme "was not worth his effort" because the time it would take to receive results-based payments was “ridiculously long for anybody to earn anything,” and insisted that he will not insist on sustaining REDD+ to the incoming governor, because it is not giving any return on investment (Ekott, 2016). This frustration by the former governor implies that whilst the State might be interested in reducing deforestation, its foremost goal is to address its socio-economic challenges. This explains the initial enthusiastic support for REDD+ as a means to attract international finance (Ekott, 2016 and Asiyanbi et al., 2017) and generate revenue for the state after it lost its monthly oil revenue following the transfer of sovereignty of the oil-rich Bakassi Peninsula to Cameroon in 2008 (BBC News, 2008 and Ekott, 2016). It also confirms, as detailed in Chapter 2, that while reducing forest emissions in RDDCs is necessary to tackling global warming, the overriding priorities of RDDCs are economic and social development, and poverty eradication (United Nations, 1992; Oliveira, 2002; World Bank, 2008). Consequently, these socio-economic needs pose constraints upon the successful implementation of its climate change mitigation measures. For instance, as evidenced in the need for the construction of the superhighway for economic growth which resulted in massive clearing of forests and land use in Cross River State.

Chapter Summary and Conclusion

This study's findings show that socio-economic factors may pose constraints upon the implementation of forest management and the climate change goals to deforestation in

REDDCs like Nigeria. This chapter demonstrate that, although Nigeria is making efforts to address deforestation, it is also faced with underlying socio-economic obstacles to meeting this goal. The findings from interviews and review of documents show that efforts to intensify forest management and contribute to climate change mitigation in Nigeria have included aligning forestry policies to its NCPRS and NDC climate change mitigation, improving its National Forest Policy in 2006, and the adoption of the REDD+ programme. However, the implementation of forest management to date shows that more needs to be done to address the socio-economic drivers of deforestation and constraints upon the implementation of forest management policies, in order to achieve a substantial reduction in the rate of deforestation in Nigeria. Cross River State, for instance, faces the challenge of the accelerating rates of deforestation, due to social and economic factors, which include the increased demand for forest resources for agricultural expansion, urban development and fuelwood extraction. Compounded by the demand for forest resources, the indirect drivers include poverty, high unemployment rate, and illegal logging. These social and economic factors have caused the loss of over 50 per cent of Nigeria's forest cover, and the need to intensify its forest management, but they also present challenges to the forest management.

Findings from this study confirm, as outlined in the conceptual framework, that access to resources, consideration of social safeguards, adequate and accessible information, and participation of stakeholders (e.g. affected communities) in decision-making may shape the implementation of environmental policies in the RDDCs socio-economic context. This implies that there may be negative implications including resistance to forest management where these social and economic factors are absent, as seen in the case of Cross River State. For instance, whereas unsustainable use of forests cannot be ignored, I found that efforts to reduce deforestation in Nigeria are challenged by socio-economic factors including poverty, poor access to resources, lack of adequate and accessible information about the benefits and tradeoffs of forest management projects on host communities, poor participation of members of the forest communities in the policy design and decision-making process, the need to develop its economy, lack of funding of the forestry sector and poor income of the forestry officials.

In addition, strict forest management interventions, with poor social safeguards, inflict negative socio-economic impacts on the forest-dependent people. As evident in the Cross River State

REDD+ programme, forest-dependent people are marginalised and forcefully banned from forests, resulting in poor access to forest resources and lands and negative impacts on their source of livelihoods. These negative socio-economic impacts are associated with strict protectionist forest management measures. One of the reasons for the targeted focus on forest-dependent people is because rural communities represent a larger number of the population who are poor, lack access to reliable and affordable energy, and often depend on forest for their basic needs. For example, in Cross River State, the use of fuelwood for energy has grown from 50 million cubic meter (m^3) per year in 1990 to 70 million m^3 per year, due to the lack of affordable energy alternatives, especially for the poorest people. It is estimated that 64.4 per cent of the rural communities in the State use fuelwood as a primary source of energy for cooking, lighting and preserving and processing agricultural produce, such as cassava flour. As an illustration, households in Buanchor community use as much as 19.760 kg fuelwood per household per annum, while per household in New and Old Ekuri, and Esuk Idebe use between 2.6kg and 10.4kg of wood, respectively, per annum (Cross River State, 2017). However, whilst, these protectionist approach portrays that Cross River State is protecting the forests, the militarised ban, which is targeted at forest-dependent people, is perceived as a tactic to gain more carbon benefit payments for the State, by excluding forest communities from the forests, adequate information, and decision-making processes. The targeted focus on forest-dependent people, also creates an imbalanced approach to forest management as attention is diverted from other drivers of deforestation, especially massive illegal logging. Illegal logging is associated with underlying socio-economic factors (poor salary of forestry officials, lack of income, poverty, unemployment, and poor access to forest resources) forest-dependent communities and affecting forestry staff.

Furthermore, even though the Nigeria's National Forest Policy and the UN-REDD suggest amongst other safeguard requirements that the programme actors including the State should ensure that forest management intervention is implemented in the context of: sustainable development and reducing poverty; improving the socio-economic well-being of the communities; guaranteeing the rights of host communities to fair and equitable share of the revenue; as well as the equitable and active involvement of affected populations in the design and implementation REDD+ plans, findings from this study confirm that there is a gap between what is on paper and what is on the ground. The targeted focus, enhanced by the ambitious target to halt deforestation and increase the State's economic growth, is without practical socio-

economic and social safeguards including access to forest and land resources. As well as the immediate adverse effect on the forest-dependent people's source of livelihood, the marginalisation of forest people from forest and land resources, and poor access to information, the REDD+ decision-making processes also promote uncertainty about land tenure right and carbon credit benefits. These socio-economic factors, including poor access to resources, marginalisation and uncertainty together create issues of resistance to forest conservation, and present adverse consequences for the successful implementation of forest management, including the REDD+ programme in Nigeria. In view of these findings, I present in the next chapter, the discussion, conclusion and contributions of this study to the literature.

CHAPTER 7

Discussion and Conclusions

"The reception of environmental communications and their 'effectiveness' in delivering change in people's attitudes and values, is highly contingent on many factors, not least the local, social and cultural contexts in which people live" (Burgess et al., 1998: 1446).

Introduction

The purpose of this research was to examine how the implementation of climate change mitigation policies is unfolding in Nigeria with respect to the socio-economic constraints upon the implementation of climate change mitigation policies, using low-carbon energy and energy efficiency in the residential sector, and forest management as a case study. In this chapter, I bring together key outputs and arguments of this research to understand and address the socio-economic constraints of climate change mitigation measures in light of the socio-economic contexts of RDDCs. First, I summarise the key findings of this study. Second, I highlight the key contributions of this research to the knowledge about socio-economic constraints of environmental management and policy implementation in RDDCs like Nigeria. Lastly, I identified some limitations of this study and directions for future research on this subject.

Whilst reference is made to the country's implementation challenges in relation to the government (i.e. deployment of renewable energy), the focus of this research is mostly on the resource-poor and forest-dependent people, whose pro-environmental behaviour and support are needed for the reduction of GHG emissions. Thus, building on the conceptual framework, the analysis of evidence centres around socio-economic factors that may promote motivation or resistance amongst the resource-poor households and communities in the sustained adoption of renewable energy and energy-efficiency, and forest conservation practices by highlighting issues of: accessibility, availability and affordability; negative social impacts including poor access to forest resources, loss of livelihoods and land insecurity; and inequitable participation in decision-making, as this social and economic aspect in relation to the resource-poor population has been largely ignored in the environmental management and policy

implementation literature. In view of the research aim, I attempted to answer the following research questions:

1. To what extent are the climate change mitigation policies being implemented in Nigeria?
2. What are the main socio-economic factors that affect Nigeria's implementation of climate change mitigation policies?
3. How do these socio-economic factors pose constraints upon the implementation of Nigeria's climate change mitigation policies?

To answer the research questions, I employed a case study methodology which involved a mixed qualitative data collection method. The mixed qualitative approach involved semi-structured interviews, qualitative survey questionnaires with, and participants observation of, professional participants including policy makers, government officials, academia and civil society groups. Secondary data including national government, media publications and technical reports on low-carbon energy and forest management policy implementation in Nigeria, were also utilised as sources of evidence for this study. The key themes that emerged from the research findings provided answers to the research questions.

Key Findings

In the subsequent three sections, I present key themes that emerged from the primary and secondary data to answer the three research questions (see Chapters 4, 5 and 6). The first section provides answers to research question 1 on the extent of implementation of climate change mitigation policies in Nigeria (see chapter 4 on the energy and chapter 6 on forest management). The second section addresses research question 2 about the main socio-economic factors that affect Nigeria's implementation of climate change mitigation policies (Chapters 4, 5 and 6). Following the two subsequent sections, I discuss the key findings to research question 3 on how socio-economic factors may pose constraints including resistance to the implementation of energy (Chapter 5) and forest management policies (Chapter 6) in Nigeria.

Research Question 1

Implementation of Climate Change Mitigation Policies in Nigeria

This section presents a summary of the answers to research question 1 in relation to the implementation of residential energy policies (Chapter 4 and 5) and forest management (Chapter 6). As discussed in Chapter 1, part of the global goals to reduce GHG emissions is through low-carbon energy and forest conservation. The findings in Chapters 4 and 5 show that as part of its contribution to the global climate change mitigation goals, Nigeria has developed low-carbon energy and energy efficiency policies to address energy-related GHG emissions, and has made some efforts in implementing its low-carbon energy and energy efficiency goals. However, overall, the progress made to date in the deployment of low-carbon energy and energy-efficient technologies is not sufficient to: 1) increase access to low-carbon energy for its growing population, 2) promote sustained adoption of low-carbon energy and energy-efficient practices amongst the resource-poor households, and, 3) meet climate change commitment to reduce energy-related emissions GHG by 2030. The outcome of which is a low rate in the adoption of renewable energy and energy-efficient practices amongst the resource-poor households.

In Chapter 6, the findings on the extent to which Nigeria is implementing its forest management policies reveal that, as with energy policies, the progress made to date to address deforestation in Nigeria is not sufficient. Despite the various legislative framework, and governmental, NGOs and communities' involvement in forest management, the conservation status across most of Nigeria's forest regimes remains poor (UN-REDD, 2012). In an attempt to address the accelerating level of deforestation and contribute to climate change mitigation, Nigeria adopted the REDD+ programme. An examination of the REDD+ Programme in Cross River State reveals that from 2008 to date, Cross River State has made some progress in the establishment of technical, capacity building, institutional and regulatory structures for its forestry sector and in readiness for REDD+ (Federal Republic of Nigeria, 2013). However, the assessment of the REDD+ programme in Cross River State to date confirms that significant work is required to produce a substantial reduction in the rate of deforestation in the State and across Nigeria. As found in Chapter 6, social and economic issues including poor access to forest resources, loss of livelihoods, land tenure insecurity and inequitable participation in decision-making are

major challenges to the implementation of forest management policies in Nigeria. These issues promote demotivation and resistance in conservation practices and may impact on the achievement of the REDD+. In the subsequent sections, I discuss in detail the key findings on the socio-economic constraints upon the implementation of climate change policies related to the energy and forestry sectors.

Research Question 2

The Main Socio-Economic Factors that Affect Nigeria's Implementation of Climate Change Mitigation Policies

This section presents answers to research question 2 as detailed in Chapters 4 and 5. In relation to research question 2, this study's findings on the implementation of climate change mitigation policies in relation to its transition to low-carbon energy is compounded by inadequate energy supply, financial and technological constraints. As shown in Chapter 4, going by its performance to date, Nigeria will struggle to achieve its goals to significantly reduce its household energy-related GHG emissions by 2030. These challenges are further compounded by its increasing energy demand and population growth, a situation projected to inevitably increase GHG emissions. Meeting its energy demand in line with its climate change mitigation goals requires a substantial upscaling in the deployment of renewable energy, which demands financial and technological commitments, both of which are currently beyond Nigeria's capacity, given the poor performance of its economy. As noted by interviewees, Nigeria relies on its vast natural resources to meet its energy demand as it currently cannot meet its energy demand with only renewable energy. This finding concurs with the argument, as highlighted in Chapter 2, by an erstwhile Nigerian Minister of Finance, that renewable energy is currently more expensive for the country to adopt in full scale, and for this reason Nigeria relies on its coal resources to meet its growing demand for energy to enable it to develop its economy (Vanguard, 2016). As highlighted in Chapter 4, Nigeria's inadequate energy supply has an adverse impact on its economy (EIA, 2016 and Federal Ministry of Power, 2017). This implies that, in the socio-economic context, considering the poor access to energy, cost of renewable energy development, inadequate capacity to deploy renewable energy, and imbalances in its energy supply and demand structure, it appears that fossil fuel will continue to play a leading role in meeting its energy needs. This seems a dilemma for Nigeria in its efforts to address

climate change, and confirms, as discussed in Chapter 2, that implementation of environmental policies is challenged as environmental goals conflict with Nigeria's socio-economic status. It also confirms that resources, as identified in the conceptual framework, can influence the implementation of environmental programs (Bresser, 2004). Although Nigeria has received some local and international support, and is progressively developing its renewable energy sector, much is still desired to meet its growing energy needs, renewable energy and climate change goals.

In Chapter 5, I further explored constraints upon the comprehensive adoption of low-carbon energy and energy-efficient technologies (e.g. solar, LPG, improved stoves, and other home electrical appliances) amongst the resource-poor households. This study's findings reveal that poor access to resources (e.g. finance, technology, energy, income) is a major socio-economic constraint on the pursuit of renewable energy and energy-efficient practices. It confirms existing studies that depict a positive correlation between accessibility, availability, affordability and adoption of modern energy and energy-efficient practices (Shove, 2015; Bisu et al., 2016; Ministry of Petroleum Resources, 2017; Ozoh et al., 2018). Evidence from this study also confirms existing findings that socio-cultural and behavioural factors are in addition responsible for the resistance to the adoption of low-carbon energy and energy-efficient technologies (e.g. Masera et al., 2000; Aviel et al., 2010; Gana & Hoppe, 2017; Rahut et al., 2019). However, I found that, while lack of awareness promotes socio-cultural beliefs, for instance, that lead to a preference for the use of inefficient cooking fuel such as firewood, awareness of environmental issues, on its own, is not enough for the sustained adoption of low-carbon energy and energy-efficient practices amongst the resource-poor people. For instance, whilst existing studies report low level of education as a factor for the lack of awareness of energy efficient practices (Ghiurca et al., 2012 and Rahut et al., 2018, 2019), I found that, besides low level of education, poor access to energy is a major factor for low awareness of low-carbon and energy-efficient practices amongst the resource-poor households in Nigeria (Chapter 4 and 5). Interviewees' responses suggest that, if the resources for low-carbon energy are accessible and affordable, particularly for the resource-poor households, then this socio-economic group will have more access to the media, which could help to improve their awareness of environmental issues (presented in accessible language), and they may then be motivated to appropriately respond to climate change mitigation measures. For instance, while the media are major sources of climate change information including mitigation measures,

many individuals in the rural areas of the country do not have access to the electricity necessary to power TV receivers, and thus may not be informed about climate change mitigation actions broadcast on TV (Odjugo, 2013). This implies that in the context of the resource-poor population, awareness of environmental issues, per se, may not be the primary motivator for the acceptance and sustained adoption of energy-efficient technologies and practices.

The analyses in Chapters 4 and 5 show that poor access to energy including inadequate energy supply, the insufficient deployment of renewable and low-carbon energy (hydro, solar, LPG) and energy-efficient technologies (e.g. improved cookstoves), and affordability constraints have an impact on the sustained adoption of efficient-energy practices amongst resource-poor households, and, consequently, climate change mitigation policy goals in Nigeria. For instance, whilst the use of LPG is growing in Nigeria, it is still least used by the resource-poor households, who in spite of the environmental consequences still prefer alternatives including firewood, charcoal and kerosene. The low adoption of LPG is attributable to such factors as widespread shortage of cylinders, poor access to gas refill outlets in the rural areas, low income and lack of access to loans or flexible payment plans to support initial costs of LPG. Besides LPG, the adoption of improved cookstoves, in the rural areas, is affected by distribution issues (Clean Cooking Alliance, 2011), whilst electric cookers have reported low acceptance and decline, due to challenges with electricity supply (Oyedepo, 2012; Kabir et al., 2018; Jewitt et al., 2020). This confirms that, as identified in the conceptual framework, resources undoubtedly influence the successful implementation of environmental management policies and measures including the adoption of renewable energy and energy-efficient practices. Even if the government and supporting agencies report success in energy efficiency due to the increased environmental awareness, there is a relatively high possibility that adoption may not be sustained, without the practical consideration of all three factors (accessibility, availability and affordability). For instance, even after adoption, it is also likely that resource-poor people may revert to their inefficient practices if they are not able to buy or service their low-carbon appliances, due to unavailability or affordability of low-carbon resources. This supports the study by the World Bank (2014), that for the resource-poor population in SSA, awareness is the least consideration in adopting energy-efficient technologies such as cookstoves. Evidence from this thesis suggests that, increasing public adoption of low-carbon energy measures will thus have to go beyond the rhetoric of *"significantly increasing public awareness,"* to

significantly and practically ensuring increased access to available, clean and affordable energy and energy-efficient technologies.

Similar to the factors influencing the adoption of low-carbon energy and energy-efficient practices, I found that socio-economic factors pose constraints upon forest conservation and the implementation of forest management policies in Nigeria (Chapter 6). Whilst institutional factors (weak and obsolete forestry legislative framework, corruption, low capacity, weak governance and poor awareness) are reported in existing literature as some of the factors affecting the implementation of forest management in Nigeria (UN-REDD, 2012; Matakala, 2016; Isyaku, 2017), my findings also rank underlying socio-economic factors as major constraints to the implementation of forest management policies.

Evidence from this thesis shows that lack of funding of the forestry sector and delays to salary payments affect the morale and capacity of forestry staff. This unfortunately has resulted in poor management of the forests at the State level. Findings reveal that forest officials either turn a blind eye or encourage illegal forestry activities such as collusion with illegal timber merchants (Chapter 6). Moreover, the SDFs and LGAs officials are not equipped with the training, skills and modern forestry techniques required to optimally manage the forest reserves. The evidence from interviews and existing data strongly supports the postulation, as identified in the conceptual framework, that resource availability can promote effective enforcement of environmental management policies including forest management. This is evidenced by the contrasting status of the forest regimes, which shows that, although the federal government is faced with the financial constraints to function effectively over the years (FAO, 2003), national parks across different States are relatively well managed than other forest and games reserves (UN-REDD, 2012). One major reason for the better management of the national parks could be relatively better funding from the federal government to the States (Caldecott & Morakinyo, 1996 and Abdulaziz et al., 2015).

In addition to funding constraints pervasive in the Nigerian forestry sector, poor access to other resources including forest, land, and income from forest resources and timber harvest royalties also contribute to disregard for forest conservation by forest-dependent communities. The analyses in Chapter 6 support the findings that efforts to reduce deforestation in Nigeria are also significantly constrained by socio-economic factors including inadequate social safeguard

considerations for the forest-dependent people, and inequitable participation of target communities in policy design and decision-making (Caldecott & Morakinyo, 1996; Oyebo et al., 2010; Krause et al., 2019). However, less attention has been given to these constraints. Instead, while, there are several drivers[27] of deforestation in Cross River State (UN-REDD, 2012), the argument of dependence on the forests by forest dwelling communities and that low awareness of deforestation drive deforestation in the State have been used to justify a strict forest management approach in preparation for REDD+. The strict forest management, however, followed a forceful ban, without prior consideration of the potential socio-economic impacts, rights and the general well-being of the affected communities, despite their potential importance in forest conservation (Krause et al., 2019). This implies that, whilst there is an increased dependence on the forests on the one hand, the strict forest management, on the other hand, seems to have neglected the constraints of the forest dependent people and their underlying socio-economic factors (poverty, unemployment, and poor access to forest resources) driving the need for forests resources. This argument aligns with the findings of Asiyanbi et al. (2019) amongst other scholars, who observed that the imposed ban for the REDD+ programme shifted the focus from sustainable forest management to strict conservation, which mostly targeted and adversely affected the forest-dependent communities. As such, there are doubts about the effectiveness of the strict forest management approach in reducing deforestation and achieving the promise of the REDD+ Strategy of reducing GHG emissions in a transparent, fair, inclusive and sustainable way (Cross River State, 2017) in Cross River State (Ekott, 2016; Akanni, 2018; Asiyanbi et al., 2019).

In addition, the deprivation of forest communities from forest resources has elevated the issue of land tenure insecurity in Cross River State and created anxiety and uncertainty about the REDD+ carbon credit benefit sharing scheme amongst the forest-dependent communities (Asiyanbi et al., 2017). The concept of carbon credit benefit sharing which is a key aspect of the REDD+ design is expected to provide incentives, which can help garner support of stakeholders who otherwise would continue with activities that degrade the forests. The ideology behind this market-based mechanism is also to encourage forest-dependent people to choose forest conservation, where the compensation available surpasses benefits from alternative forest uses (Angelsen et al., 2012). Findings captured in this thesis reveal that the

[27] e.g. commercial land use, infrastructure development, illegal logging, forest fires, poor funding and low capacity of the forestry sector, weak forest laws, and land tenure insecurity.

carbon benefit scheme may not achieve its intended purpose, due to peculiar challenges of land tenure insecurity in Nigeria. For instance, the strict forest ban and issues of community land rights not formally recognised in Nigeria have further created the suspicion in forest communities that the ban is a ploy by the state government to gain the carbon credit benefit payments. The goals of the REDD+ programme to reduce deforestation with carbon credit benefit payment is thus doubtful, if solutions to critical issues such as marginalisation, access to forest resources and tenure rights of affected communities are not resolved.

In addition to the forest ban, the suspicion that the government has taken greater advantage of the REDD+ carbon credit payment is further strengthened by the poor access to adequate information and the exclusion of forest communities from the policy design and decision-making processes. This inequitable affair in the Cross River State's REDD+ programme contradicts the National Policy (2006) objectives to: *promote a collaborative forest management partnership with rural communities for the sustainable management of forest resources in and outside forest reserves.* A collaborative forest management partnership, as envisaged in the National Policy (2006) should protect the interests of forest people and safeguard their participation in policy design and decisions making measures to protect the forests. This also includes, as laid out in the Cancun Safeguards guidelines, to: *ensure the full and effective participation of relevant stakeholders, in particular indigenous peoples and local communities.* However, as seen in the Cross River State REDD+ programme, these forest management objectives and safeguard guidelines have not been practically considered, and their poor consideration poses negative consequences to the success of forest management in Nigeria.

Research Question 3

How socio-economic factors pose constraints upon the implementation of climate change mitigation policies

Poor Access to Resources and Resistance in Climate Interventions

This section presents answers to research question 3 as detailed in Chapters 5 and 6. This study concludes that poor access to resources (finance, energy and forests), poor consideration of

social safeguards for resource-poor people, and inequitable involvement of target communities in policy design and decision-making pose constraints upon the implementation of climate change mitigation policies in Nigeria. In relation to the energy sector, this thesis concludes that insufficient attention to the energy constraints such as poor accessibility, unavailability and unaffordability of energy resources in Nigeria could lead to poor acceptance or increased resistance to the adoption of low-carbon energy and energy-efficient measures by the resource-poor public. Ensuring that renewable energy is affordable is suggested as one of the best options for sustained adoption amongst resource-poor people (Federal Ministry of Power, 2016). This is important given that majority of Nigerians, in the rural and urban areas, are on low incomes, and cannot afford the cost of low-carbon and energy-efficient appliances. Interviewees' responses suggest that unless a radical step is taken to abate the poor access to energy, the use of fuelwood and fossil-fueled generators would further increase. This adds to studies on household energy transition (e.g. Oyedepo, 2012 and Dioha & Emodi, 2019), which provide evidence that a radical scaling-up of low-carbon energy is urgently required to reduce Nigeria's energy demand, unsustainable energy sources (e.g. firewood and PHFFGs), and residential energy-related GHG emissions. The importance of urgently scaling-up access to low-carbon energy to reduce residential energy-related emissions in Nigeria is similar to the findings of Riti & Shu (2016) and Dalberg (2019), who demonstrate that an urgent and substantial investment in low-carbon energy will reduce the demand for PHFFGs, and the rate of residential energy-related GHG emissions. As estimated by Dalberg (2019), the demand for small fossil fuel generators is expected to increase by 8 million units by 2030. By Dalberg's estimation, this means that the NDC goals to: *improve electricity grid, provide energy access to all Nigerians;* and the SE4ALL access to energy goals to increase: *access to modern electricity to a total capacity of 45 GW in 2030, and on-grid renewable energy supply from 26 per cent in 2016 to 70 per cent in 2030,* need to be substantially and urgently implemented to reduce energy insecurity. This is necessary in order to meet the SE4ALL goal to*: reduce the use of self-generated power from the 74 per cent level in 2012 to about 18 per cent in 2030,* and thus avoid the risk of a drastic increase in the rate of GHG emissions and deforestation in Nigeria.

When it comes to the issue of forest management, the story is similar to that of the energy sector. Evidence from this study corroborates the argument of Sunderlin et al. (2008) that the

goal to reduce deforestation by 2030, without the practical considerations of access to resources, social safeguards, land security and community engagement in policy design and decision-making may lead to negative socio-economic impacts on forest-dependent communities, whose sustenance and wellbeing depend on the forests. Similar to previous findings, this study concludes that the practical consideration of these social and economic factors is crucial to promote community support and ensure effective management and sustainability of forests (e.g. Agrawal et al., 2011; Beymer-Farris & Basset, 2012; Abdulaziz et al., 2015). For instance, as detailed in Chapter 6, forest-dependent people, in Cross River State, lost interest in forest conservation, due to the negative social and economic impacts of the strict ban on access to forests and lack of compensation, and are posing resistance to forest management, with threats to destroy the forests (Cross River State, 2017 and Isyaku et al., 2017). Individuals and communities affected by unemployment, loss of income and livelihoods, due to strict forest interventions, without practical considerations of negative social impacts and provisions of social safeguards, are also prone to being lured into colluding with illegal loggers by timber merchants.

Further to poor access to forest resources, evidence from this study also shows that poor access to information about the benefits and impacts of the REDD+ programme, and inequitable participation of stakeholders in decision-making could promote demotivation and resistance to forest conservation. As earlier highlighted in Chapter 2, the equitable and active involvement of stakeholders in policy design and decision-making promotes policy implementation (O'Toole, 2000; Bressers, 2004; De Boer & Bressers, 2011). Thus, where this is lacking, there may be barriers to the implementation of policies. For instance, evidence shows that, in addition to poor access to forest resources and poor consideration of social safeguards, RDDCs forest management projects often failed because forest-dependent communities were excluded from or not well represented in these processes (e.g. Hatcher & Bailey, 2011 and Asiyanbi, 2016). In relation to cooperation between the policy implementers and the target groups in African countries, Ajulor (2018) argues that effective consultative and participatory approach to policymaking and implementation is lacking. According to Ajulor, in many instances, policy objectives or projects are embarked on without taking the affected communities involved in the project into consideration. Such attempts have adversely impacted on policy implementation, due to non-involvement and poor cooperation by the target group, or the sabotaging of excellent programmes introduced to supposedly improve their lives. Similarly,

the demotivation for forest conservation and resistance to the REDD+ implementation could in turn jeopardise Nigeria's deforestation, and consequently, climate change mitigation goals.

Implications and Contributions of the Research

This study makes some important contributions to the knowledge: on environmental management, environmental policy implementation, energy transition and forest management; on factors that shape environmental policy implementation in the context of RDDCs; and the constraints upon the implementation of climate change mitigation policies and interventions in Nigeria. It uses evidence from the empirical findings and case studies to validate the factors proposed in the conceptual framework, and to draw the conclusion that the major socio-economic constraints upon the implementation of climate change mitigation measures in the context of RDDCs is poor access to resources, poor consideration of social safeguards for resource-poor people, and inequitable involvement of target communities in policy design and decision-making. This thesis extends the debates on pro-environmental behaviour and the adoption of environmental practices in the field of environmental management and policy implementation by showing that acceptance and sustained adoption of environmental practices (e.g. energy-efficient and forest conservation practices) in RDDCs and especially amongst the resource-poor requires more practical actions by moving beyond public awareness and ensuring access to resources. This is evident, as the preceding empirical chapters demonstrate, in the implementation of low carbon energy and forest management measures to date in Nigeria.

The study established an original analytical framework (Context-Specific Socio-economic Constraints Framework). This is achieved through identifying factors (Resources, Motivation, Feasibility, Acceptability and Resistance) from the conceptual framework, which built on Bressers' (2004) CIT framework and the literature on resistance to policy change. These factors were useful in developing the contribution of this thesis to the environmental management and policy implementation literature, as they confirm, and expanded the understanding on the socio-economic factors that shape policy implementation in the context of RDDCs including Nigeria. The focus on Nigeria was particularly useful for this study as, although it has the largest economy and population in Africa; and an economy which is closely

tied to oil and gas exports, as well as agriculture, some of the socio-economic issues (e.g. poverty, poor access to energy and forest resources, land insecurity, social inequalities, poor engagement of citizens in policymaking and decision-making) related to Nigeria are similar to those reported about other SSA countries. So, in gaining a better understanding of the main policy implementation challenges in regards to the socio-economic context of Nigeria, it was important to understand how factors such as natural resources, finance, income, and information, poor consideration of social safeguards, citizens engagement in policymaking and decision-making may promote or inhibit implementation. Understanding the factors that shape the implementation of environmental policies is crucial to the response to climate change in Nigeria. The vast majority of studies on socio-economic factors that shape environmental policy implementation have focused on socio-cultural factors including socio-norms and poor environmental practices. These studies have established a positive correlation between low level of education and lack of awareness of environmental issues and barriers to implementation of environmental management measures. Such narratives call for greater emphasis on promoting public awareness and education as strategies to encourage pro-environmental behaviour and, inadvertently, promote approaches that focus on strict environmental management measures.

This study has extended previous debates by adding that, while socio-cultural or behavioural factors are present, the social and socio-economic factors that shape the implementation of climate change mitigation policies must be understood. Social and socio-economic factors such as poor access to, unavailability and unaffordability of, resources (e.g. energy and forests), poor consideration of social safeguards, lack of adequate and accessible information about the benefits and tradeoffs of environmental projects on host communities, and poor participation of the communities in the policy design and decision-making process, could lead to poor acceptance or increased resistance to the sustained adoption of low-carbon energy and energy-efficient and forest conservation practices.

In view of the debates on lack of environmental awareness and the importance of environmental protection (e.g. Latham, 2013; Mfon et al., 2014; Mba, 2018), and the increased focus on public awareness, this thesis adds that there is a gap in the understanding between public response to environmental mitigation (pro-environmental behaviour) and their influencing factors (Kollmuss & Agyeman, 2002 and Shove, 2015). One possible explanation

of what may be responsible for this gap is the top-down assumption that poor environmental practices are due to lack of information on environmental issues and, thus, raising environmental awareness would automatically lead to the acceptance of environmental measures and more pro-environmental behaviour. This top-down assumption about poor environmental practices, which has become the dominant tool for environmental management, however, may not be applicable in some contexts (e.g. Burgess et al., 1998; Blake, 1999; Kollmuss & Agyeman, 2002).

Whilst public awareness and pro-environmental behaviour are central to promoting environmental management, I argue that the arguments for an increased need for public awareness and pro-environmental behaviour, however, inadvertently often address environmental management issues within a 'blind spot' of ambitious policy design and implementation, which loses focus of the root causes of dependence on natural resources by the resource-poor people, and the social and socio-economic impacts and constraints of environmental policy interventions on poor target communities. Building on Burgess et al. (1998) argument, I draw attention to a pertinent point, that early rationalist models of pro-environmental behaviour, which assume that raising environmental awareness would automatically lead to more pro-environmental behaviour, might have ignored some facts about social realities or situational factors as pertaining to different geographical context (i.e. socio-economic constraints - issues of poor access to, unavailability and unaffordability of, resources in RDDCs). This thesis makes an argument that simple models of pro-environmental behaviour and the adoption of renewable energy and energy-efficient, and forest conservation practices by the resource-poor population may not be entirely applicable in the socio-economic context of Nigeria, given its poor energy access, low-income, and land insecurity issues. What is required is an integrated model that also takes into account the social and socio-economic contexts (e.g. poor access to resources, low income, poverty) of the country as affecting the resource-poor. This is important, especially, as it is assumed that people act rationally and will always make systematic use of information available to them (e.g. Ajzen, 1991; Abrahamse et al., 2007; Steg & Vlek, 2009). By implication, this could also mean that people will adopt climate change mitigation actions (e.g. low-carbon energy and forest conservation), if they have the information or awareness of climate change impacts, efficient energy and forest conservation. However, Kollmuss & Agyeman argue that the notion that more knowledge will result to pro-environmental behaviour is too much of a simplistic assumption. Kollmuss &

Agyeman's argument is on the premise that it is often difficult to change old habits, irrespective of the advantage of a new one over the old habit. That said, findings from this thesis raise the argument that some people (i.e. the resource-poor) could change their old habits, if they have the available resources to do so. This includes ensuring sustainable access to energy and forest resources provided by the government and policy implementing actors to the resource-poor people. Habits such as the use of firewood for cooking, portable fossil-fuelled generators for household energy and / or incandescent bulbs, as identified in Chapter 5, could be changed or the use of such inefficient-energy practices could be reduced amongst the resource-poor, if they have access to and can afford renewable energy and energy-efficient technologies. Similarly, the increased use of forest resources for energy could also change or be reduced. This implies that, the socio-economic impacts of denying resource-poor people access to energy and forests, as well as the provision of subsidies and loans to resource-poor households to help purchase renewable energy and energy efficient technologies should be carefully considered to promote motivation and support for climate change mitigation interventions.

In addition, this thesis contributes to the debate in the environmental management and climate change literature on the dependency on and increasing use of fossil fuels and forest resources, and the accompanied GHG emissions and deforestation in RDDCs including Nigeria. While recognising the need for a low-carbon pathway in reducing GHG emissions, I draw on debates from the social policy, environmental politics and international development literature to make a clear distinction between the desire for carbon-neutral economy and the risks of a full transition to renewable energy for resource-poor communities, and how the implementation of climate change policies confronts social and economic challenges in the contexts of RDDCs (Pegels, 2015; Jakob & Stekel, 2016; Nordensvard, 2017). This implies that there needs to be a balance between totally decarbonising the RDDCs fossil fuel energy and ensuring access to energy for all. In as much as Nigeria desires to reduce GHG emissions and follow a renewable energy pathway by 2030, I argue that in practice, the desire to meet its commitment to a renewable energy path and reduce GHG emissions through household energy use is complicated by its current growing energy demand and inadequate capacity (financial and technological) to fully meet its energy demand with renewable energy (Pan African Centre for Climate Policy, 2017). This thus creates the need for an increase in the use of its natural resources (gas, coal, nuclear) to address its growing energy demand over the next decades (Federal Ministry of Power, 2016). On the one hand, an increased dependence on its fossil fuel

energy may in the long term affect its climate change mitigation ambitions as emissions from fossil fuel energy increases. Moreover, as noted by Avila et al. (2017) expanding gas infrastructure for electricity generation will require effective management to prevent methane leaks. This will require substantial financial and technological investments and will be one of the biggest challenges of mitigating climate change while providing electricity. On the other hand, it seems that without substantial financial and technological investments to substantially up-scale renewable energy, reducing its fossil fuel energy share to meet climate change mitigation goals may be too ambitious for Nigeria, currently struggling to meet its growing energy demand. Consequently, this may further reinforce the existing poor access to energy resources and an increased use of inefficient energy (e.g. fuelwood and PHFFGs), and residential energy-related GHG emissions, as well as affect the implementation of its climate change mitigation goals to reduce its GHG emissions from the energy sector by 20 per cent by 2030.

Reflections and Future Research

Conducting this qualitative study with government officials at various environmental departments, social and environmental NGOs, research and academic institutions, and private sector actors, was necessary to gain an in-depth understanding of how the implementation of climate change mitigation policies is unfolding in Nigeria. The multi-case study approach was useful in examining and identifying the main socio-economic constraints upon the implementation of climate change mitigation policies in relation to RDDCs, especially the resource-poor population. It provided a better understanding of how these constraints are related across the different sectors (e.g. energy and forest) and how they can shape the implementation outcomes across different environmental policies. The examination of the socio-economic constraints across the different sectors was useful in validating the factors (Resources, Motivation, Feasibility, Acceptability and Resistance) outlined in the conceptual framework, and their potential impacts on the successful implementation of renewable energy and forest management policies in RDDCs such as Nigeria. Consequently, these findings will contribute to developing a holistic approach to forest management to address the accelerating rates of deforestation in Nigeria. Employing a more holistic and strategic approach to environmental management that speaks to Nigeria's socio-economic contexts could result in

pro-environmental behaviour, feasibility, and an increased motivation and support for sustained adoption of renewable energy and energy-efficient and conservation practices. However, reflecting on the findings and the method used, I see that this current study opens up possible avenues for further research that might be conducted with the resource-poor / affected target groups to explore the influence of resources, social safeguards, community engagement, and public awareness on the adoption of renewable energy and energy-efficiency, and forest conservation practices. This includes to:

- measure the acceptance and sustained adoption of renewable energy and energy-efficient practices by resource-poor households.

- measure how much impact that environmental awareness, without access to energy resources, has on the acceptance and sustained adoption of renewable energy and energy-efficient practices by resource-poor households.

- measure the impact that incentives and income, with and / or without environmental awareness, have on the acceptance and sustained adoption of renewable energy and energy-efficient practices by resource-poor households.

- measure the uptake of LPG by resource-poor households after the rolling out of the planned 600,000 gas cylinders to encourage usage of LPG by Nigerian government.

- measure how much impact that access to forest resources has on forest conservation.

- measure the level of forest conservation by affected communities after the REDD+ readiness in Cross River State and / or other States that have adopted REDD+.

Recommendations

After the examination of the implementation of energy and forest management policies in Nigeria, it is necessary to suggest that in addition to raising environmental awareness, policymakers and implementation agencies need to ensure that poverty is addressed in tandem

with climate change mitigation goals. Evidence from this study in Chapters 4 and 5 shows that the implementation of **Renewable Energy and Energy-Efficiency Measure** is constrained by poor access to energy resources and affordability of funds. This implies that the adoption of renewable energy and energy-efficient practices may face resistance as, without access to resources, there will be continuous use of inefficient energy and appliances. To address the socio-economic constraints upon the implementation of climate change mitigation in regards to household energy emission, it is critical for policy implementing actors and the government to address the inability of the resource-poor to adopt renewable energy and energy-efficient technologies by:

- promoting adequate access to, as well as ensuring the affordability of, renewable energy and energy-efficient technologies for resource-poor households both in the rural and urban areas.

- promoting increased access to finance including subsidies and access to loans for the sustained adoption of renewable energy and energy-efficient technologies amongst the resource-poor population.

In regards to **Forest Management,** evidence from this study in Chapter 6 shows that poor access to resources, poor consideration of social safeguards, land security and lack of community engagement in policy design and decision pose constraint upon the implementation of forest management policies including REDD+. To improve forest conservation in Nigeria, it is necessary for forest management policy implementing actors, as well as the state to:

- promote practical consideration of social safeguards by ensuring prior in-depth assessment of social and socio-economic impacts of environmental mitigation projects like REDD+ on the livelihoods of host communities.

- While participation of stakeholders in decision-making may not automatically transform community forest conservation, it is nonethelsess important to ensure a wider participation of stakeholders including forest communities and representatives of those affected in policy design and decision-making processes.

- promote accessible information and effective communication of relevant information about the benefits and impacts of mitigation projects on host communities.

- promote the creation of economic incentives for increased involvement of forest communities in forest conservation.

- promote programmes for sustainable use of forests for forest communities.

- address the issues of land insecurity for forest communities.

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APPENDICES

APPENDIX 1

Interviewee's Information Sheet for Data Collection

Information Sheet

Research Title: Climate Change Policy Implementation in Nigeria

Researcher: Daisy Alero Emoekabu

I am a PhD student researcher at the School of Social Policy, Sociology and Social Research - University of Kent, UK. This research seeks to understand Climate Change policymaking and implementation in Nigeria, and thus contribute to the effective implementation of policies and strategies to help reduce the effects of climate change on the country.

You have been selected to take part in this study because you are a stakeholder from a government agency, academic institution, non-governmental or community-based organisation, or the private sector, and an actor involved in Nigeria's Climate Change policy/decision-making.
This study will involve a one-to-one interview lasting approximately 45 to 60 minutes. Using a predefined lists of questions, the interview will be conducted in your office or another suitable location of your choice. For the purpose of accurate data collection, I will, with your permission, be using a voice-recorder to record all information provided. The recordings will be kept safely and will only be used by me for the purpose of this study.

You are not obliged to participate in this study, and if at any time during the interview you are uncomfortable or do not wish to respond to a question, you have the right not to respond, and, if you so wish, to terminate the interview. The information collected from this study will be confidential and will only be used for the purposes of my research. No personal information will be requested and no information provided will make any participant identifiable. There are no risks or benefits from taking part in the study, but your participation will be of great help to this research, which is conceived as a contribution to climate change education to help reduce the effects of Climate Change in Nigeria. The results of this study will be published and, with your consent, you / your organisation will be acknowledged in the thesis, published articles and presentations. Where relevant, your remarks may be used in the thesis, articles or presentations, but they will only be attributed to you if you expressly give your permission.

If you choose to take part, you will be asked a series of questions about Climate Change and constraints upon climate policy implementation in Nigeria. If you consent to the information gathered from this study being used, please read the instructions and fill out the consent form.

If you have questions about this study, please do not hesitate to ask before we conduct the interview. If other questions arise after the interview, you may contact me: **dae4@kent.ac.uk**

If you have any questions about your rights as a participant in this research, you can contact my supervisors at the University of Kent: Professor Christopher Rootes (email C.A.Rootes@kent.ac.uk) and /or Dr Joy Zhang (email - Y.Zhang-203@kent.ac.uk).

School of Social Policy, Sociology & Social Research, University of Kent, Cornwallis NE, Canterbury, Kent CT2 7NF

APPENDIX 2
Interviewee's Consent Form for Data Collection

Consent Form

Title of Research: Climate Change Policy Implementation in Nigeria
Researcher: Daisy Alero Emoekabu

Please tick all boxes

- ☐ I have read this form and the research study has been explained to me. I have been given the opportunity to ask questions and advised whom to contact.
- ☐ I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.
- ☐ I have been informed that the interview will only be recorded with my consent and that I will receive a copy of this consent form once signed.
- ☐ I consent to the recording of this interview and I am aware that all information I disclose in this study is confidential, and that my anonymity will be maintained, unless I expressly consent to be identified.
- ☐ I agree to participate in this study
- ☐ I agree to allow the researcher to quote my remarks in the thesis, published reports, articles and presentations about this research study.
- ☐ I agree to allow the researcher to acknowledge my / organisations' participation in this study in the thesis, published reports, articles and presentations.

_____
Participant's Name

_____ _____
Signature Date

_____ _____
Name of Person Obtaining Consent Date

NOTE:
If you agree to participate, be quoted and acknowledged but do not wish to be identified by name, please indicate as needed. In all cases, you will be given a copy of this form to keep for your records.

APPENDIX 3
List of Interviewees and Survey Participants

INTERVIEWEE / PARTICIPANT CODE	GEO-POLITICAL ZONE	SECTOR
1	South East	Ministry of Environment
2	South East	Ministry of Environment
3	South East	Ministry of Environment
4	South East	Ministry of Environment
5	South East	Academic / Research Institution
6	South East	Academic / Research Institution
7	South East	Academic / Research Institution
8	South East	NGO / CSO
9	South East	NGO / CSO
10	South East	NGO / CSO
11	South East	NGO / CSO
12	South West	Ministry of Environment
13	South West	Ministry of Environment
14	South West	Ministry of Environment
15	South West	Ministry of Environment
16	South West	Ministry of Environment
17	South West	Academic / Research Institution
18	South West	Academic / Research Institution
19	South West	Academic / Research Institution
20	South West	Academic / Research Institution
21	South West	NGO / CSO
22	South West	NGO / CSO
23	South West	NGO / CSO
24	South West	NGO / CSO
25	South West	NGO / CSO
26	South West	Business
27	South South	Ministry of Environment
28	South South	Ministry of Environment
29	South South	Ministry of Environment
30	South South	Ministry of Environment
31	South South	Ministry of Environment

32	South South	Academic / Research Institution
33	South South	Academic / Research Institution
34	South South	Academic / Research Institution
35	South South	Academic / Research Institution
36	South South	NGO / CSO
37	South South	NGO / CSO
38	South South	NGO / CSO
39	South South	NGO / CSO
40	South South	Business
41	North	Department of Climate Change
42	North	Department of Climate Change
43	North	Ministry of Environment
44	North	Ministry of Environment
45	North	Ministry of Environment
46	North	Ministry of Environment
47	North	Ministry of Environment
48	North	Ministry of Environment
49	North	Academic / Research Institution
50	North	Academic / Research Institution
51	North	NGO / CSO
52	North	NGO / CSO
53	North	NGO / CSO
54	North	NGO / CSO
55	North	NGO / CSO
56	North	REA
57	North	NGO/CSO

Appendix 4

Interview questions

Background of respondents

1. To which of these Ministries or Agencies do you belong? Please indicate:

- The Ministry of Environment / Climate Change Department
- Other Ministry / Agency
- An academic / research institution
- An NGO or community organisation
- A private sector organisation

2. Is this under the:

- Federal
- State
- Local government

3. If State or Local government, please specify _____

4. How long have you worked at this Ministry, Agency or Organisation?

- 0 to 5 years
- 6 to 10 years
- 11 to 15 years
- more than 15 years

5. Have you ever been or are you presently involved in any of the following?

- Policymaking to address climate change
- Implementing climate change policy
- Advocating action to address climate change

6. If yes, in what capacity (at what level) were you or are you presently involved?

- Federal
- State
- Local government

General climate change questions

1. Do you think Nigeria as a nation is doing much to tackle Climate Change?

2. How committed is Nigeria to climate change policy implementation?

3. Do you think Nigeria can develop economically and simultaneously tackle Climate Change?

4. What is the perception of low-carbon development?

5. Is the Nigerian public aware of Climate Change?

6. Do you think Nigerians as individuals / groups are doing much to tackle Climate Change?

7. Is Climate Change awareness promoted in Nigeria?

8. How is Climate Change awareness promoted in Nigeria? Please specify

9. Does more need to be done to raise awareness of Climate Change in Nigeria? If yes, why?

10. What are the major social and socio-economic factors do you think affect or may affect implementation of low-carbon energy development?

11. What can Nigeria do to improve on its climate policy implementation?

Low-carbon energy and energy efficiency measures

1. What are the available strategies in place to reduce GHG emissions in the household energy sector?

2. To what extent is Nigeria implementing its renewable energy policy goals?

3. To what extent is renewable energy being deployed?

4. What socio-economic factors do you think affect or may affect the deployment of renewable energy?

5. What is the perception of renewable energy and energy-efficient practices amongst the public?

6. To what extent is renewable energy being adopted by the resource-poor population?

7. What social and socio-economic factors do you think affects or may affect the sustained adoption of renewable energy?

8. To what extent are energy-efficient technologies being adopted / used by the resource-poor population?

9. What social and socio-economic factors do you think affect the sustained adoption of energy-efficient technology and use amongst the resource-poor?

10. How do social and socio-economic factors affect the sustained adoption of renewable energy by the resource-poor?

11. How do social and socio-economic factors affect the sustained adoption of energy-efficient technology and use amongst the resource-poor?

12. What resources are available to promote low-carbon energy development?

13. What subsidies / incentives are available for low-income people to promote low-carbon energy?

Measures to reduce deforestation

1. What are the available strategies in place to reduce forest deforestation?

2. To what extent is Nigeria implementing its forest management policy goals?

14. What social /economic / socio-economic factors affect forest management in Nigeria as whole?

15. What are the social and socio-economic impacts of forest management programmes (e.g. REDD+ in Nigeria and Cross River State)?

16. How can social and socio-economic factors affect forest conservation in Nigeria?

17. What is the perception of forest conservation amongst the forest-dependent people?

18. To what extent is forest management being practiced?

19. What social and socio-economic factors do you think affects or may affect the implementation of forest management policies including the REDD+ programme in Nigeria?

20. What resources are available to promote forest conservation amongst the forest-dependent people?

21. What incentives are there to promote forest conservation amongst the forest-dependent people?

22. How does poor participation / engagement of forest communities in the policy design and decision-making processes affect forest conservation practices?

Appendix 5

Some implemented and planned energy projects to date

Name of action	Main objective	Implementing entity	Steps taken	Outcomes achieved
RE projects	Large Scale Hydro Power Projects: Objective Hydropower Development by FMPWH	Federal Ministry of Power	6 hydropower stations to be commissioned (Note: This is for the Zungeru project.).	Sites identified and potential estimated
	Dam Projects: Construction and rehabilitation dams for hydropower electricity generation.	Federal Ministry of Power	7 dams rehabilitated or commissioned for a hydropower generation	All sites identified and 7 completed
RE Projects	Energy Efficiency: shift from firewood to clean cook stoves	Federal Ministry of Environment (FMENV), Federal Ministry of Women Affairs and International Centre for Energy Environment and Development (ICEED)	The alliance is to distribute 30 million clean and energy efficient cook stoves in 5 years	Sensitization partly done
RE Projects	Energy Efficiency	FMENV, Aso savings and loans Plc	First project launched in Kaduna with the prospect of containing 2000 Housing Units; other states to roll out similar housing schemes	One project launched
RE Projects	Energy Efficiency Rural Women Energy Security (RUWES)	MDGs and Federal Government of Nigeria's Transformation Agenda	Small off-grid lighting systems that use light emitting diodes (LEDs) have been supplied to rural women	more than 1.3 million women have registered
RE Projects	Solar Power: NAIJA LIGHT Solar Electrification Programme	Federal Ministry of environment	Develop patent and production thereafter	Patent developed
Nigeria Feed-in Tariff for Renewable Energy Sourced Electricity	An optimal economic instrument for hydro schemes not exceeding 30MW, all biomass cogeneration power plants, solar and wind-based power plants, irrespective of their sizes	Nigerian Electricity Regulatory Commission	By 2020, a total of 2,000 MW generated through biomass, small hydro, wind and solar	14 PPAs initiated for about 1,125MW to the grid
RE Projects: Biofuels	Biofuel Production	Ministry of Environment and Global Biofuels Ltd	11 biofuel plants to be developed	One site identified and potential remaining ones planned
RE Projects: Biofuels	This initiative is to produce sugar for local use and export, ethanol and ultimately electricity	RE Program Office, Adamawa State Government and Green Carbon Africa	12 ethanol and sugar production plants to be developed	2 sites identified and 10 planned

Author's compilation from (Department of Climate Change (2018)

Appendix 6

Cross River State's REDD+ Readiness programme workplan and budget

OUTCOME 3. **Institutional & technical capacity for REDD+ in Cross River State strengthened**

Implementation level: **CRS**

Outputs	core / indicative activities	Estimated UN-REDD budget (US$)			
		FAO	UNDP	UNEP	Total
3.1 CRS REDD+ Unit fully functional and effective	• CRS REDD+ Unit strengthened (*e.g.* office, vehicle, equipment, field travel, operational costs). • Personnel: CTA (international, 50%, Calabar-based), stakeholder mobilisation specialist, Admin-Finance specialist, consultant support. • Specialised training for CRS REDD+ Unit and CRSFC; attendance of workshops & conferences. • Meetings of CRS REDD+ committees & associated working structures		448,318		448,318
3.2. CRS stakeholders, with emphasis on forest communities, trained & engaged on REDD+	• Support to the CRS Stakeholder Forum on REDD+. • Training (broad-based & specialised). • Awareness raising for government officials, state legislators and local governments. • Awareness raising, training & organizational strengthening for communities • Participatory governance assessment		235,000		235,000
3.3. CRS REDD+ Strategy is constructed	• REDD+ Strategy building, including assessments such as: forest conservation and use, agriculture, energy, livelihoods, rural economy, biodiversity & ecosystem services, development issues, SEEDS and LEEDS, traditional knowledge and cultural practices • Legal review, including customary laws and by-laws associated with land use plans, and proposed legal/policy reforms to enable a REDD+ mechanism in CRS. • Design of the REDD+ institutional/implementation framework & Drafting of a State Law on REDD+. • Analysis of land tenure dimensions and carbon rights' issues [in conjunction with Output 1.3]. • Free, prior & informed consent (FPIC) for REDD+ and Recourse Mechanisms • Assessment of benefit distribution options, including consideration for women and vulnerable groups, and design of an equitable and transparent mechanism based on input from relevant stakeholders • Participatory & cross-sector development/adoption of a REDD+ Strategy for CRS		270,000		270,000
3.4. CRS forest monitoring system operational [in conjunction with Output 2.2 and relevant Federal agencies]	• GIS laboratory & full equipment for forest monitoring [data to be shared with Federal Govn't] • Satellite information management & interpretation / Specialised trainings. • Support to the nationwide stratification of forests [in conjunction with Federal agencies] • Design of the forest inventory and cost analysis (at state-level) • Community-based verification and monitoring of forest cover. • National guidelines for community forest management in development • Collect and harmonise existing forest data (to be shared with federal government). • Establishment of Reference Levels (based on forest coverage & socio-economic conditions). • International MRV advisor (50%)	662,000			662,000

OUTCOME 4. **REDD+ readiness demonstrated in Cross River State**

Implementation level: **CRS**

Outputs	core / indicative activities	Estimated UN-REDD budget (US$)			
		FAO	UNDP	UNEP	Total
4.1. REDD+ experimental initiatives in the state well coordinated & supported	• Criteria & guidelines for the development of REDD+ pilot projects • Technical support to REDD+ experimental initiatives and their stakeholders. • Creation & administration of a fund to support community initiatives for REDD+ (aim: to foster and experiment alternatives to deforestation, local forest management & community empowerment) – *estimated budget: US$ 150,000.* • Establish a REDD+ registry and approval process (for enhanced coordination of pilot projects)		255,000		255,000
4.2. REDD+ investments enabled [REDD+ Phase II triggered]	• Analytical support for forest transformation and a transition to a low-carbon economy with sustainable livelihoods {UNEP} • Preparation of investment plans and enabling programmes for REDD+ (transition to a low-carbon and climate-resilient development path in CRS) {UNDP/UNEP}. • Financial resource mobilization, donor visits & dialogue (aiming at catalysing global climate funds, donor support and philanthropic funding). {UNDP/UNEP} • Design of a financing mechanism for REDD+. {UNDP}		100,000	158,000	258,000
4.3. CRS established as a centre of excellence & learning on REDD+	• Establishment of a training & knowledge management centre (open for practical training on REDD+ readiness planning for other states and abroad). • Knowledge management and dissemination of best practices of REDD+ readiness. • REDD+ database developed [in conjunction with Output 2.2 and with FAO's inputs]. • Organising a major international REDD+ event. • Design of social & environmental safeguards, including design of information system [in conjunction with Output 3.3] {UNDP/UNEP} • Field-level testing and monitoring of social & environmental safeguards. {UNDP} • Assessment of ecosystem-based multiple benefits in CRS and in the national context, and identification of proposed indicators/actions [to feed into outputs 2.3 & 3.3] & participatory collection of information on the achievement of ecosystem-based benefits {UNEP} [co-finance will be required for nation-scale work on ecosystem-based multiple benefits] • Web-platform developed to allow transparency of data and results, and dissemination [in conjunction with Outputs 2.2 & 3.4]. {UNEP, with FAO technical lead} • Information, public awareness & training materials. {UNEP}		200,000	200,000	400,000

Author's compilation from UN-REDD (2012).

Appendix 7
List of Policy Documents Reviewed

Policy Name	Date	Author	Scope and Objectives
National Climate Change Policy Response and Strategy (NCCPRS)	2012	Department of Climate Change	The NCCPRS is Nigeria's policy to climate change, which aims to promote low-carbon and high growth economic development path, while building a climate-resilient society.
Nationally Determined Contributions (NDC)	2015	Federal Ministry of Environment	The NDCs is the communication of countries' conditional and unconditional mitigation targets for the reductions in GHG emissions. Nigeria's NDC is in line with the objectives of the NCCPRS and the enforcement of existing energy and forest policies for the period of 2015-2030.
First Biennial Update Report (BUR1) of Nigeria	2018	Department of Climate Change	BURs are reports, submitted by non-Annex I Parties, of updates of national GHG inventories, including a national inventory report and information on mitigation actions, needs and support received.
National Renewable Energy and Energy Efficiency Policy (NREEEP)	2015	Ministry of Power	The NREEEP sets out the Nigerian government's plan to increasingly harness the country's renewable energy and energy efficiency resources in driving sustainable development across the country. It is developed in line with the country's national energy policy, and outlines the government's programs and measures for deploying renewable energy and energy efficiency technologies and practices towards facilitating Nigeria's green transition.
Renewable Energy Master Plan	2005, 2013 (updated)	Energy Commission of Nigeria and the United Nations Development Programme	The REMP outlines Nigeria's vision and plan for renewable energy to achieve sustainable development. It seeks to increase the supply of renewable electricity from 13% of total electricity generation in 2015 to 23% in 2025 and 36% by 2030.
Sustainable Energy for All (SE4ALL) Nigeria Initiative	2012	Federal Republic of Nigeria	The SE4ALL Action Agenda of Nigeria is a national implementation tool for SDG 7 on access to affordable, reliable, sustainable and modern energy for all by 2030, and the Paris Agreement, to reduce GHG emissions.
National Forest Policy	2006	Federal Ministry of Environment	The National Forest Policy is in line with the national objectives and the principles guiding sustainable development, which aim to manage the country's forestry sector in a way that the forests would continue to meet the needs of the present generation without compromising the rights of future generations.
Nigeria REDD+ Readiness Programme Document	2012	UN-REDD and Federal Republic of Nigeria	The Nigeria REDD+ Readiness Programme document outlines the plan for the two-track approach to achieve REDD+ readiness in Nigeria. It documents how REDD+ readiness programme will simultaneously build capacities at federal (national) and state (sub-national) levels, in a cooperative fashion, and how the work at federal level will provide the national policy direction for REDD+.
REDD+ Readiness Preparation Proposal (R-PP)	2013	Federal Republic of Nigeria	The REDD+ R-PP document is an evolution of Nigeria's REDD+ Readiness Programme (2012). It incorporates the outcomes and activities under the on-going UN-REDD support and incorporates

			several improvements following the comments and recommendations from the FCPF.
Cross River State Forestry Commission Law	2010	Cross River State	The Cross River State Forestry Commission Law outlines the provisions for the establishment of the State Forestry Commission. It is for the purposes of providing sustainable management of the forest and wildlife resources, preservation and protection of the ecosystem in Cross River State.
Cross River State REDD+ Strategy	2017 (Final draft)	Cross River State	The Cross River State's REDD+ Strategy aims to inform the national strategy and serve as a platform for learning and structural planning for REDD+ preparedness and implementation in other states.