NIGERIA

NDC IMPLEMENTATION IN NIGERIA THROUGH GREEN INVESTMENTS BY PRIVATE SECTOR

A SCOPING STUDY

MARCH 2021

AFRICAN DEVELOPMENT BANK GROUP
GROUPE DE LA BANQUE AFRICAINE DE DÉVELOPPEMENT

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The African Development Bank

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FOREWORD

In 2015, the Paris Agreement on Climate Change acted as a steppingstone for the climate change mitigation and adaptation until 2030, notably by mandating all signatory countries to keep global warming below 2°C through the submission of Nationally Determined Contributions (NDC).

To date, 54 African countries have committed to the Paris Agreement's objectives with an estimated cost of about $1.2 trillion by 2030. It is expected that 75% of this budget will come from the private sector, whose participation to concrete climate change actions need to be strengthened and to be guided towards opportunities for bankable and green investments on the continent.

Nigeria faces climate threats that negatively impact the socio-economic development of the country, notably with sea-level rise in the South and desertification in the North. In 2016, Nigeria ratified its NDC and outlined its priorities in the fight against climate change. By 2030, Nigeria committed to unconditionally reduce its carbon emissions by 20% compared to the 2010 baseline and by 45% with international support. Nigeria's NDC emphasize the importance of climate change adaptation actions as the country already suffers from climate change impacts. In terms of adaptation measures, the priority sectors are Health, Environment, Disaster Risk Management, Water, Forestry, Agriculture, Energy and Transport.

The African Development Bank (AfDB) is committed to support Nigeria in its structural transformation as well as in its inclusive and green growth, notably with the integration of climate change aspects in all operations of the Bank in Nigeria. The AfDB is also currently assisting to raise Nigeria's climate ambitions via support to the Nigerian government in the current NDC revision.

Aligned with the country's NDC, the Bank has adopted Nigeria's Country Strategy Paper (CSP) for the period 2020 – 2024. For the next five years, climate resilience is at the core of the strategy which is based upon two mutually reinforcing priority areas: (i) Supporting Infrastructure Development and (ii) Promoting Social Inclusion through Agribusiness and Skills Development.

The CSP provides the opportunity to assist Nigeria in its infrastructure development and its social inclusion. This process will be conductive to the investment of private sector towards transformative activities to enhance a transition for a greener economy that supports sustainable employment creation.

In addition to these initiatives, Nigeria was selected under the Fund for Africa Private Sector Assistance (FAPA) for its Private Sector Investment Initiative for NDC in Africa to help the country leverage its strong private sector to mobilise green investments for NDC implementation. As 60% of the national investment are channelled through the private sector, the Bank considers that this initiative will strengthen the capacity of the sector to participate in profitable climate actions and to protect their businesses from climate risks and explore opportunities to invest in climate-friendly projects and businesses in Nigeria.

The Bank is pleased to present this report which is a significant addition to various other targeted actions that Stantec is helping us build in Nigeria to increase private sector investment in green business.

Mr. Ebrima Faal
African Development Bank
Senior Director

Nigeria Country Department

ACKNOWLEDGEMENTS

This study was prepared by a team from Stantec led by Ms Komal Hassamal, Key Senior Climate Finance Expert with her team at the country level Dr. Paul Abolo, Nigeria Country Expert, Mr. Andrew Ogaga, Nigeria Private Sector expert. The quality of the report was reviewed by Prof. Fobissie Kalame, Team Lead, and supported by the team Ms Ozlem Duran, Key Sector Expert, Rebecca Lamas, Key Sector Expert, Ms Virginie Quarre, Project Manager, Mr. Alessandro Bhegelli, Project Manager Assistant. The communication and design of the report was done by Ms Justine Marchal, Communication Expert.

The team benefited from the comments suggestions and collaboration with the Bank experts, development partners, key Government officials, businesses that were interviewed as well as during an online validation workshop webinar on 25th June 2020 with 260 participants.

The Government represented by the Federal Ministry of Environment from the Department of Climate Change participated in the process of the preparation of this study Dr. Peter Tarfa, Former Director, Mrs. Halima Bawa-Bwari, Acting Director, Ms Chioma Amudi Felistas, Principal Scientific Officer/ Nigeria NDC Desk Officer and Mr. Huzi Ishaku Mshelia, Nigeria NDC Revision Coordinator.

We gratefully acknowledge the role of the senior staff of the Bank including Mr. Ebrima Faal, the Nigeria Country director and Dr. Anthony Nyong, the Climate Change and Green Growth Director for spearheading this study. Their respective team Mr. Dorsouma Al Hamdou, Climate Change and Green Growth Division Manager, Dr. Innocent Onah, Climate Change and Green Growth Consultant in Nigeria, Ms Sonia Borrini, Communications and Knowledge Management Specialist, Mr. Gerald Esambe, Senior Climate Change and Green Growth Officer, Mr. Fadekunayo Adeniyi, Climate Change and Green Growth Consultant were key to the finalization of the report.

The study was peer reviewed by the team from Natural Eco Capital in charge of designing climate change tools for SMEs in Nigeria, Dr. Eugene Itua, Team Leader, Mr. Linus Orakwe, Project Manager, Mr. Chidi James, Nigeria Country Expert.

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Currency used - July 2020

1 $ = 387.471 NGN

1 NGN = 0.00258 $

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LIST OF ACRONYMS

AFOLU	Agriculture, Forest, and Other Land Use
BRT	Bus Rapid Transit
BUR	Biennial Update Report
CDM	Clean Development Mechanism
CO2	Eq carbon dioxide equivalent
COP	Conference of Parties
CPEIR	Climate Public Expenditure and Institutional Review
CSO	Civil Society Organization
DAE	Direct Access Entity
DARE	Nigeria Developmental Association for Renewable Energies
DCC	Department of Climate Change
DFID	Department for International Development -UK
DNA	Designated National Authority
DPR	Department of Petroleum Resources
ECN	Energy Commission of Nigeria
ER	Emission reduction
FAO	Food and Agricultural Organization
FMARD	Federal Ministry of Agriculture and Rural Development
FME	Federal Ministry of Environment
FMJ	Federal Ministry of Justice
FMPWH	Federal Ministry of Power, Works, and Housing
FMWR	Federal Ministry of Water Resources
FNC	First National Communication
GCF	Green Climate Fund
GDP	Gross domestic product
GEF	Global Environment Facility
GHG	Greenhouse gas
ICCC	Inter-ministerial Committee on Climate Change
ICEED	International Centre for Energy Environment and Development
ICREEE	Inter-ministerial Committee on Renewable Energy and Energy Efficiency
ICT	Information and Communications Technology
IEA	International Energy Agency
INDC	Intended Nationally Determined Contribution
IPCC	Intergovernmental Panel on Climate Change
IPPU	Industrial Processes and Product Use
MDAs	Ministries, Departments and Agencies
MSW	Municipal Solid Waste
NAMA	Nationally appropriate mitigation action
NASRDA	National Space Research & Development Agency
NASPA	National Adaptation Strategy and Plan of Action
NASPA-CCN	National Adaptation Strategy and Plan of Action for Climate Change Nigeria
NCCPRS	National Climate Change Policy Response and Strategy
NDC	Nationally determined contribution
NEP	National Energy Policy
NERC	National Electricity Regulatory Commission
NGO	Non-governmental organizations
NiMET	Nigeria Meteorological Agency
NIMS	National (GHG) Inventory Management System
NNPC	Nigerian National Petroleum Corporation
UN	United Nations
UNDP	United Nations Development Programme

UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WAPP	West African Power Pool
$	United States Dollar

SUMMARY

Nigeria's active engagement in global climate diplomacy dates back to 1994 when it became a Party to the UN Framework Convention on Climate Change (FCCC). The spans include its ratification of the Kyoto Protocol in 2004 and the submission of its First National Communication (FNC) to the UNFCCC in 2003 and Second National Communication in February 2014; two years after, the Nigeria Climate Change Policy Response and Strategy was approved by the Federal Executive Council in September 2012 (NDC, 2015). In the context of the Paris Agreement in 2015, Nigeria ratified its Nationally Determined Contributions (NDC) in 2016 with a commitment to reducing its GHG emissions by 20 %; unconditionally; and 45% conditionally. Nigeria's key priority sectors as outlined in its NDC for climate change mitigation are Energy, Agriculture and Land Use, Transport and Industries while the priority sectors for climate change adaptation are Health, Environment, Disaster Risk Management, Water, Forestry, Agriculture, Energy and Transport.

Insufficient financing in climate change investment in the implementation of Nigeria's NDC continues to be a concern, the donor community has been mobilizing climate finance necessary to leverage current financial flows to support achievement of the NDC objectives. This scoping study is to boost private sector in supporting the country in bridging this gap. The study involves identifying the challenges, opportunities and providing recommendations for upscaling NDC through private sector green investments, with a focus on the following seven key sectors: Climate Smart Agri-business and Forestry; Transport and Infrastructure; Green Building and Smart Cities; Power: including Oil & Gas, Renewable Energy and Energy Efficiency; Waste Management; Water and Irrigation; and Financial Sector.

To achieve the Paris Agreement goals, each country is requested to enhance its NDC post -2020. In this context, the current NDC of Nigeria is being revised to flesh out adaptation measures as well as include water and waste management sectors as priorities.

By assessing the institutional and strategic framework on climate change at national and private sector levels for the Nigerian NDC implementation, it was established that the national development policy and vision framework provides direction for developing mitigation and adaptation projects and programmes. The preliminary estimates of investment need for low-carbon development in Nigeria (Agriculture, Oil & Gas, Power and Transport) between 2010 and 2035 was estimated at $142 billion (World Bank, 2013).

An emerging body of experience suggests that considerable potential exists for closing the green investment gap by mobilizing private finance through the targeted deployment of public finance. It is crucial to reform policies and incentives to give the right signals to investors, providing a strong enabling framework for investing. In parallel, private sector investment can be achieved by using a range of proven instruments and mechanisms to help reduce the cost of capital and investment risks.

An analysis of sustainable finance opportunities in Nigeria, estimates sustainable investment is $92 billion annually till 2030, presenting an opportunity for private sector investment in green development of more than $10 million every hour (UNEP, 2018). NDC green investment opens up the need for innovation and new green and inclusive business models and also provides opportunity for companies to contribute to green growth and climate action on a profitable basis, by developing new products and services, diversifying their business streams, as well as reaching new targets.

This report possesses successful examples of private sector green investment projects in Nigeria that implement the NDC in each of the seven sectors required for this study. For instance, in December 2017, Nigeria issued the first certified sovereign bond and the second one originating in Africa. The proceeds of the bonds were utilized in funding green public and private sector projects.

The study presents the role of the various development partners, and the landscape of international and national climate funds that provide support through various financial instruments for the private sector projects that are aligned with the NDC priorities. This is unfortunately not familiar to entrepreneurs willing to develop greener businesses.

Despite government will on climate action, significant barriers exist to securing the required scale and pace of progress for private sector engagement in green investment. These include policy and regulation conflicts; such as the massive budgetary subsidies for fossil fuels; lack of awareness of the private sector climate change opportunities and benefits; and insufficient communication on successful NDC private investments. Other identified challenges are lack of access to investment deal-making community for financing and match-making as well as the complexity of navigating the climate finance instruments. There is a perceived lack of understanding of climate adaptation measures and what constitutes the benefit of adaptation for businesses; insufficient capacity training on climate change for the private sector; and inadequate reliable data on climate change are all necessary to make predictions and informed decisions. Unfamiliarity with the green technologies that are perceived as high capital cost in the early stages of development, as well as the lack of capacity to comply with the Environmental and Social Safeguards law, are also constraints that need to be resolved to support upscaling private investment in greener businesses.

These challenges, notwithstanding, present a platform for new business opportunities for the private sector. The study presents opportunity ideas in the seven key sectors under focus as well as some cross-cutting prospects in complying with international standards such as embracing the Environmental and Social Governance principles that can leverage transparency and gain favorable access to global capital markets to power future green growth. The report encourages multinational and domestic corporations to use innovation and digital technology to drive digital infrastructure, financial inclusion, and a cashless society. The report identified 20 green private sector projects aligning with the NDC priorities that requires investment support. The scoping study concludes by recommending modalities to upscale the implementation of the Nigeria NDC through private sector investment

1. INTRODUCTION

1.1 Study Context

Since becoming a Party to the UN Framework Convention on Climate Change (FCCC) in 1994, Nigeria has been actively engaged in climate diplomacy. It ratified the Kyoto Protocol in 2004, submitted its First National Communication (FNC) to the UNFCCC in 2003 and Second National Communication in February 2014. The Federal Executive Council approved the Nigeria Climate Change Policy Response and Strategy in September 2012 (NDC, 2015).

Following the ratification of its Nationally Determined Contributions (NDC) with a commitment to reducing its GHG emissions by 20% unconditionally and 45% conditionally, Nigeria ratified its agreement of the Paris Agreement in 2016. Under its NDC, the key priority sectors for climate change mitigation are Energy, Agriculture and Land Use, Transport, Industries. Comparatively, the priority sectors for climate change adaptation are Health, Environment, Disaster Risk Management, Water, Forestry, Agriculture, Energy and Transport.

In response to the perceived lack of private sector engagement in climate change investment, the donor community mobilized climate finance necessary to leverage current financial flows to support achievement of NDC objectives. The Bank's initial response is targeting six countries in Africa, of which Nigeria is one of the selected countries.

There are significant challenges to implementing the NDC strategies including the lack of private sector engagement and climate change investments.

The Scoping Study (the "Study") starts with an assessment of the institutional framework at national and private sector levels for NDC implementation in terms of mitigation and adaptation; as well as an assessment of the seven (7) Bank's key sectors in terms of priorities, policies, strategies and plans. The report then identifies the challenges associated with implementation of green investment for NDC implementation in Nigeria. It also examines the availability and deployment of finance and resources for green investments. Finally, the study identifies the opportunities for green investments for NDC implementation. Central to this report, presented in Annex 2, is the identification of a list of twenty private sector companies that could support NDC implementation.

2. OBJECTIVES

The objectives of this scoping study are: (i) to assess challenges and opportunities for NDC implementation by the private sector and (ii) to support the private sector in accessing green financing for NDC implementation in Nigeria. This study focuses on seven (7) key sectors that include:

1. Climate Smart Agri-business and forestry;
2. Transport and Infrastructure;
3. Green Building and Smart Cities;
4. Power: Oil and Gas, Renewable Energy and Energy Efficiency;
5. Waste Management;
6. Water and Irrigation; and
7. Financial Sector.

This document can be used to inform the revision, development and implementation of the national NDC process and actions.

3. METHODOLOGY

The methodological approach included primary and secondary data collection.

Primary data: A questionnaire was developed and adopted to ensure harmonized information gathering from identified stakeholders. Stantec counted on the existing network of the country expert and the Private sector expert from Nigeria, which has been built from over 10 years working in the country and region. Furthermore, the key expert used her network to engage with donors and stakeholders in the country. The field work at country level was of utmost importance with the aim of maximizing ownership and relevance, by harnessing inputs from various local stakeholders in consultation with Government, industry players, and sector-specific technical partners.

To collect the required data in a time-bound manner, the Stantec team undertook three approaches:

- **Approach 1 – secondary data:** The team conducted an extensive desk study centered on data gathering. The team organized the research activity required under this task with the team's knowledge about climate change financing and the Nigerian NDC context. After a detailed desk study, the team identified the data gaps, and for bridging the data gaps the team adopted approach 2.
- **Approach 2** – **primary data:** The team sought support from stakeholders in Nigeria listed in Annex 1:
  - Reached out to the concerned stakeholders (ministries, private sector representatives, UNDP, etc.).
  - Discussed with the Bank local country office and regional team to understand the country's context and the Bank's position.
  - Exchanged with various Bank's private sector Task Managers (Renewable energy & Energy Efficiency and Transport divisions) responsible for Nigeria to understand the challenges in the country.
  - Discussed with the NDC focal point (who is also the GCF National Designated Authority or NDA), from the Federal Ministry of Environment.
  - Shared with all stakeholders a summary of the findings of the scoping study in a factsheet format and encouraged to provide comments.
  - Created a webpage on the AfDB website with all information on Nigeria and with relevant contact details for further consultation: https://tinyurl.com/y3hk766d

- Hosted an online consultation workshop on June 25, 2020 in which 260 participants were able to ask questions and provide comments, some of which were used to revise and finalize this report.
- Engaged with Natural Eco Capital team in charge of Nigeria who provided substantive comments to this report.
- A second round of comments were received from the Department of Climate Change of the Federal Ministry of Environment.
- An interview with the Bank senior director by the communication team was conducted.

- **Approach 3** - The pipeline development task involved a comprehensive technical and market analysis of the private sector, as well as of climate finance in Nigeria. Information through primary and secondary research techniques and existing know-how about the sector benefitted this task. This exercise enabled to find opportunities in the various sectors as outlined in the study that are mapped out in chapter 7 and table in Annex 2.
  - The key expert engaged bilaterally with the Bank Task Managers of the transport division and identified two potential transport projects to consider in developing Green Climate Fund concept notes.

3.1 Limitation of the study

The various contacts made by the Bank, Stantec and with the support of the UNDP to the Department of Climate Change was delayed. This was due to the challenges of the bureaucracy involved with obtaining approvals for release of such information. The report benefitted from limited interaction with the government to produce this study. The pipeline identification process faced another bottleneck where the private sector had reluctance to release business information for reports. However, the latter has been resolved by recruiting a private sector expert with knowledge of Nigeria's business context. A list of potential projects is presented in Annex 2

The COVID-19 lockdown also presented challenges with restriction of physical movement from the sector expert and the country expert to source information such as meeting all donors, stakeholders and potential private developers. Therefore, there was a high reliance on the know-how and contact of the country expert and the private sector expert to realize the study as well as interviews and some consultations were conducted virtually.

4. COUNTRY CONTEXT

4.1 Geography and Population

Nigeria is located on the west coast of Africa between the Atlantic Ocean in the south and the Sahara Desert in the North. With a landmass of 923,768 square kilometers, a total boundary length of 4,900 kilometers and a coastline of 853 kilometers, Nigeria is the 14th largest country in Africa. Nigeria is bordered to the north by Niger Republic, to the east by Chad and Cameroon, to the south by the Gulf of Guinea of the Atlantic Ocean, and to the west by Benin Republic (BUR 1, 2018).

Nigeria's population is estimated at 200 million as at 2019 with an annual population growth rate of 2.6%, with a median age is 18 years. Nigeria boasts a youthful population with a labor force participation rate of 55 % (World Population, 2020).

4.2 Political Aspects

Nigeria's Federal Republic comprises a Federal government based in its capital city of Abuja and 36 states and the Federal Capital Territory (FCT), Abuja, in addition to 774 Local Government Area Councils.

Nigeria operates the presidential system of government made up of three arms of government at the federal level: Executive, bi-cameral Legislature and Judiciary with state legislatures having a single chamber.

The country held national elections in 2019, for the sixth consecutive time since its return to democracy in 1999. The incumbent president, Muhammadu Buhari won the elections and was sworn in for a second term on 29th May 2019.

President Buhari has identified fighting corruption, increasing security, tackling unemployment, diversifying the economy, enhancing climate resilience, and boosting the living standards of Nigerians as main policy priorities his government seeks to continue to pursue in his second term up till 2023. Nigeria's federated structure gives significant autonomy to states.

4.3 Economic and Social Context

Nigeria as one of the largest economy in Africa, accounts for 18.3 % of the continent's GDP, and its production structure of the economy has greatly diversified since 2012 with agriculture, trade and, information, communication and technology (ICT), and financial services playing greater roles and together contributing more than half of total GDP. In 2017, the economy emerged from a recession, posting real GDP growth of 2.1 % in 2018 and oil production reaching 2 million barrels per day (mbpd), from 1.8 mbpd in 2017 (African Development Bank, 2018). However, declining oil prices in early 2020, drove prices below $30.00 per barrel, further compounded by the COVID-19 pandemic and drastically reducing federally collected fiscal revenues and poses an economic challenge for Nigeria (CNBC,23 April 2020). The volatile nature of the global oil market in which the Nigerian economy depends upon has recently been questioned repeatedly, with a call to diversifying to other sectors of the economy. Blue economy is one of such sectors with the potential to drive the economic growth and job creation. The primary segments of the Blue Economy ecosystem include the following: 1. Maritime Transportation, 2. Fisheries, 3. Alternative wind and coastal wave power sources (Renewable energy), 4. Tourism, 5. Climate Change (carbon sink), 6. Waste Management.

The intricate relationship between corruption, enabling business environment and economic development compelled the efforts at fixing the nation's corruption reputation that ranks 148th out of 180 countries with a score of 27 out of possible 100 for corruption (African Development Bank, 2018). Another challenge to economic development is the state of infrastructure such as electricity supply, water supply and healthcare. The rising wave of terrorism occasioned by the Boko Haram insurgence and the increase in domestic crisis such as kidnapping and armed robbery is challenging the socio-economic development as well (Evans & Kelikume, 2019).

4.4 Climate Vulnerability

Nigeria is located largely within the lowland humid tropics; generally characterized by a stable relatively high year-round temperature on account of being located in the Africa Sahel Region. The mean temperature in the tropical south is 32°C and 41°C in the arid north. The climate varies from a very wet coastal area with annual rainfall greater than 3,500 mm to the Sahel region in the northwest and north-eastern parts, with annual rainfall less than 600 mm. However, within the last few decades, the average temperature has been on the rise (Haider, 2019).

Climate models indicate that Nigeria's climate will generally become more variable, with high levels of uncertainty regarding climate projections in the Africa Sahel zone. Temperatures in the Sahel have increased more sharply than the global trend, and the average predicted rise in temperature between 1980/99 and 2000/2009 is between 3°C and 4°C, which is more than 1.5 times the average global trend. Sea level rise of 1 meter or more could result in a loss of 75% of the Niger Delta – a crucial and fragile marine habitat that also serves as a vital carbon sink has seen depleted fish stock (Merem et al., 2019). Deforestation is driven by population growth and the related demand for land for various other uses, including settlement development and logging.

The 2015 National Integrated Infrastructure Master Plan for Nigeria (NIIMP) acknowledged the risk to attainment of development goals arising from unmitigated effects of climate change. The report called out the impact of climate change in making food, energy, and water security more difficult for Nigeria to achieve. Climate variability impacts the reliability of data used to plan future investments increasing stranded asset risk due to under-performance or cost overruns. Importantly, from a planning perspective, it could also affect Nigeria's infrastructure and make future investments costlier or require other types of investments to make the infrastructure climate resilient.

More recently, the country has witnessed how increases in temperature in the northern region caused higher levels of evaporation causing dams to lose stores of water affecting critical infrastructure such as hydro-power dams and agriculture livelihoods. High variability in climate patterns triggers destructive floods and prolonged drought that destroys farms, and occasional forced displacement and migration of farm communities. A more recent example is the long drought that dried up the Lake Chad, and this severely impacted socio-economic conditions while causing dislocation of the population that depends on the Lake. This is often cited as having exacerbated the spate of terrorism in the region, as unemployed youths join the Boko Haram terrorist group as a means of livelihood (Okpara et al., 2016).

5. INSTITUTIONAL AND STRATEGIC FRAMEWORK

5.1 National development policy and vision

Upon assuming office, the Buhari administration decided in 2017 to chart a new economic plan for the nation, known as Economic Recovery and Growth Plan (ERGP) which is a medium term (2017-2020) all-round developmental initiative. The Federal Ministry of Finance, Budget and National Planning was charged with coordinating the implementation, as well as monitoring and evaluation for this purpose, and will, amongst other things, build up its capability for robust monitoring and evaluation (ERGP, 2017). Strategy number 47 of the ERGP highlights the environmental sustainability and climate change activities listed as:

- Implement projects under the Great Green Wall initiative to address land degradation and desertification, and support communities adapting to climate change (e.g., plant trees)
- Implement environmental initiatives in the Niger Delta region (e.g., continue the Ogoni Land clean-up and reduce gas flaring)
- Raise a Green Bond to finance environmental projects
- Establish one forest plantation in each state
- Rehabilitate all forest reserves and national parks to enhance eco-tourism
- Establish a functional database on drought and desertification
- Encourage and promote the development of green growth initiatives

With the imminent termination of the ERGP in 2020, the Federal Government has started work on replacing the plan with a Medium-Term Economic Growth Accelerator Plan 2021-2024. An essential plan of the new economic accelerator plan is the introduction of tax incentives for investments in infrastructure and capital market ("NIPR" 2019). However, with the emergence of the COVID-19 pandemic and the drastic reduction in oil prices, the government announced a stimulus package as part of its post COVID-19 economic sustainability plan. It has promised a stimulus spending package of N2.3 trillion (about $5.9 billion) with the aim of keeping economic contraction to minus 0.59%.

The plan seeks to:

- Stimulate the economy by preventing business collapse and ensuring liquidity,
- Retain or create jobs in key areas like agriculture and housing,
- Undertake growth enhancing and job creating infrastructural investments,
- Promote manufacturing and local production, and

- Extend protection to the very poor and other vulnerable groups.

A number of key projects are also included in the plan such as accelerating access to cleaner, greener energy with the installation of solar home systems for up to 5 million households.

5.2 Climate change coordination

The Federal Ministry of Environment, through the Department of Climate Change (DCC) is central in coordinating the relationships concerning climate change activities, vertically and horizontally. DCC relates vertically with the subnational entities, the legislative arms of the government including the Presidency; and horizontally with other ministries, departments and agencies. DCC coordinates partnerships and collaborations with development partners, government organizations, NGOs, academia and the private sector (BUR1, 2018).

The department's 2018 budget, across nine budget items is about $ 750,000. 16.5% is allocated to national implementation of the Government of Nigeria's ("GoN") NDC; while 8% is allocated to development of climate public expenditure and institutional review (CPIER) process for Nigeria. Critical support and capacity building to strengthen linkages and research centers got 13.4% of the allocation, while 9.6% was allocated to implementation of strategic sustainable climate change and environmental advocacy tools (FSV Nigeria, 2019). Refer to Table 1 in Annex: Network of the institutional relationship for climate action in Nigeria.

The Inter-Ministerial Committee on Climate Change (ICCC) is the supervisory body for climate action in Nigeria. ICCC is headed by DCC, Federal Ministry of Environment. The sector working groups, comprising: Energy Working Group, IPPU Working group, AFOLU Working Group and Waste Working Group, all report to the ICCC.

Nine Ministries (members of the ICCC) get their data-feed from the Ministries, Departments and Agencies (MDAs), which are sector data providers (reference to Annex 3, Table 1). At the subnational level, the Climate Change units are state-level data providers which forward data to the NBS (Statistics), from which it is sent to DCC.

The Nigeria Meteorological Agency (NiMET) and the BUR team equally send their data to the DCC data unit (FSV, Nigeria 2019). The relationship between the private sector and the public sector under the ICCC is not defined.

6. NIGERIA NATIONALLY DETERMINED CONTRIBUTIONS

6.1 Overview of Nigeria's NDC Commitment

At the 71st United Nations General Assembly (UNGA) in New York, the President of Nigeria, M. Buhari signed the Paris Agreement and announced Nigeria's commitment to the implementation of its Nationally Determined Contributions (NDC) 2015.

Nigeria's Intended Nationally Determined Contributions became NDC in May 2016 with a pledge to reduce emissions by 20% while stating that with international support and funding, emissions will be reduced by another 45% by 2030; hence the phrase for Nigeria's NDC became '*20% unconditionally and 45% conditionally*'. However, the document is under review to include the water and waste management sector. Under its current NDC, the key priority sectors for climate change mitigation are Energy, Agriculture and Land Use, Transport, Industries. Preliminary estimates of investment need for the energy and mitigation-related activities are around $142 billion (World Bank, 2013). Comparatively, the priority sectors for climate change adaptation are Health, Environment, Disaster Risk Management, Water, Forestry, Agriculture, Energy and Transport.

In general, Nigeria plans to increase knowledge and awareness of climate change risks and opportunities, to undertake and implement risk assessments and risk reduction measures. Some other adaptation specific measures mentioned in the NDC are:

- Construction sector: Nigeria plans to increase standards and specifications
- Agriculture, forestry and land use: Nigeria plans to improve crop and livestock systems and resource management, to improve existing programs and policies and to initiate a research programme on climate change.
- Energy: Nigeria plans to include protective margins in construction and placement of energy infrastructure, to undertake risk assessment and risk reduction measures to increase resilience in the energy sector, to strengthen existing energy infrastructure, to develop and diversify secure energy backup systems to ensure both civil society and security forces have access to emergency energy supply, to expand sustainable energy sources and decentralise transmission in order to reduce vulnerability of energy infrastructure to climate impacts.

Key mitigation areas include: energy, oil and gas, agriculture and land use, industry and transport. The targets and key interventions are 20%-30% emission reduction by 2030. Key adaptation areas include: improve awareness and preparedness for climate change impacts; mobilize communities for climate change adaptation actions; reduce the impacts of climate change on key sectors and vulnerable communities; and integrate climate change adaptation into national, sectoral, State and Local Government

planning and into the plans of universities, research and educational organizations, civil society organizations, the private sector and the media. The economic objective is to grow the economy by 5% per year, improve standard of living, and enable electricity access for all.

6.2 Implementation of the NDC

Nigeria is one of the 41 countries globally (of 7 countries in Africa) benefiting from the UNDP- NDC Support Programme. The Programme is focused on four outputs that were identified:

- Development of a financial strategy for the country's NDC Sectoral Action Plan.
- Enhanced private sector engagement and participation in the implementation of the national climate mitigation and adaptation actions with particular focus on the NDC.
- Monitoring and Transparency: Establish a database of current mitigation and adaptation actions to track progress towards NDC targets; The database will be fully integrated in the future national MRV system.
- Awareness and advocacy: Develop a communication strategy to raise awareness among the public and private sectors and civil society about the commitments undertaken by Nigeria under the NDC; Target the Office of the Senior Advisor to the President on the SDGs in order to align the achievement of SDGs and the NDC. Essentially, it includes the mainstreaming of the NDC, SDGs and Disaster Risk Reduction under the Sandai Framework into the national economic development plan (ERGP).

The NDC Support Programme will enhance the capacities of key institutions to mobilize finance for the Action Plan; increase private sector participation to catalyze the necessary investments; catalogue climate-related actions undertaken by various parties to measure progress towards the achievement of NDC targets; and help Nigeria inform and raise awareness on the Action Plan among public and private sector actors.

Furthermore, Nigeria has developed its green bond market in the region as an instrument through which to implement its NDC. In December 2017, Nigeria issued the first certified sovereign bond and the second one originating in Africa. The proceeds of the bonds were utilized in funding three green projects- the Energizing Education Project, Rural Electrification Project and the Afforestation Project. As the largest nation in sub Saharan Africa, Nigeria intends to develop the green bond market in the region. It also sees this as an opportunity to align its own financial markets with the government's climate objectives as detailed in the NDC.

Green Bonds, also known as Climate Bonds, are fixed income securities issued to finance projects that have a positive impact on the environment and provide solutions to climate change. Green Bonds can be issued by Governments or a private sector organization.

The issuance of Green Bonds provides funds for financing the implementation of projects towards the achievement of Nigeria's commitments to the Paris Agreement.

Recently, North South Power Company Limited through NSP-SPV Plc issued the N8.5 Billion Green Guaranteed Infrastructure Bond to fund the company's generation of sustainable energy to Nigerians. The Banking sector is not left out, as Access Bank also recently obtained the approval of the Securities & Exchange Commission (SEC), to commence the Book Building process for its proposed N15 Billion Green Bond ($38.5 million). The details of these bonds are presented in Annex 3 in the tables 2 to 5 of this report.

Due to increased local appetite for green bonds, the SEC and Nigerian Stock Exchange have respectively issued regulations on the issuance of green bonds. These regulations are modelled after the Green Bond Principles, an international set of guidelines which promote the integrity of green bonds market.

To qualify as a green bond in Nigeria, the proceeds of these bonds must be invested in one or more of the following projects:

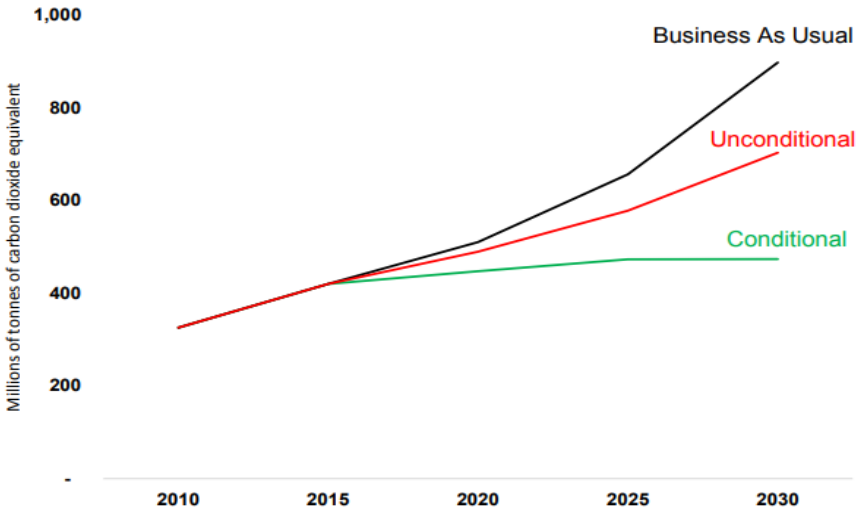
1. Renewable and sustainable energy;
2. Clean transportation;
3. Sustainable water management;
4. Climate change adaptation;
5. Energy efficiency;
6. Sustainable waste management;
7. Sustainable land use;
8. Biodiversity conservation;
9. Green buildings (Commercial Real Estate Development); and
10. Any other categories as may be approved by the SEC

The lesson learned is that traditionally, investors evaluated their investment decisions based on financial measures alone. However, in recent time, these decisions have taken into consideration not just financial but also Environment Social Governance (ESG) concerns. Although sustainable finance, particularly green bonds, is still in its nascent stage in Nigeria, it is definitely an area to watch due to increased consciousness of institutions and investors in the protection of the environment. (TNP Law Firm, 2019).

6.2.1 Mitigation: Greenhouse gas emissions/ carbon trade

On a national scale, Nigeria emitted 110.7mt of carbon in 2018 with a substantial portion of this emission coming from industry, an inevitable outcome of inefficient production systems and obsolete machineries deployed to the production process. Evidence from contemporary development patterns links industrialization to economic prosperity, a pattern that Nigeria policy makers intend to replicate as proposed in various economic plans. Under a business-as-usual scenario where a high-carbon emission industrial footprint perpetuates, Nigeria's sustainability path is not looking so bright as it is clogged with negative externalities that are counterproductive to long-run productivity.

Figure 1: Nigeria Greenhouse gas emissions projection



Source: Nigeria NDC 2016

Nigeria's carbon management policy stands to gain from aligning national emissions planning to international mechanisms such as Emissions Trading Scheme (ETS) and the Clean Development Mechanism (CDM). Following recommendations at the Kyoto Protocol which were ratified in subsequent climate change conferences, developing countries (Annex II countries) have been presented with a multiple of intervention options for charting a green future.

Nigeria has had rising carbon emissions. Industrial sector carbon trading provides ample opportunity for extending market-based emission reduction strategies to other sectors of the Nigerian economy. Success on a national scale has the potential to position Nigeria as the leading regional carbon trading center.

The Article 6 of the Paris Agreement has yet to be agreed. It focuses on the carbon markets elements such as developing a common accounting framework for international cooperation and establishing a central UN mechanism to trade credits from emissions reductions generated through specific projects.

Carbon markets are a big deal, both in terms of potential emissions reductions and the cost savings they can generate. Half of countries' initial NDC (constituting 31% of global emissions) include the use of international cooperation through carbon markets. According to IETA, the potential benefits to cooperation under Article 6 include cost savings of $250 billion per year in 2030. International cooperation through carbon markets can bring additional public and private finance and catalyze emissions reductions in a country hosting the mitigation activity.

Nigeria has the potential to prevent carbon emission for as much as 3.7 billion tons over 25 years (World Bank, 2013). Even if just a fraction of that potential could be turned into assets tradable in the carbon markets of the future, the revenue-generating potential could be significant. This should be a sufficient argument to induce Nigeria to closely monitor the evolution of international discussions on future carbon markets.)

6.2.2 Adaptation

Nigeria's climate vulnerability lies predominantly along the coastal, littoral states of the south and the northern frontline states as a result of a combination of high physical exposure as well as low household and community resilience. Poor adaptive responses to growing shifts in temperature, rainfall, storms, and sea levels could help fuel violent conflict in some areas of the country due to shortages of resources such as land and water which breeds negative secondary impacts such as more sickness, hunger, and joblessness, which in turn flings the doors to conflict and social chaos wide open.

There is a lack of institutional, legislative and fiscal capacity for effective management of natural resources and stability of the ecosystem; leading to reduced farm productivity, increased workload particularly on women, and a dislocated rural economy.

Adaptation to climate change refers to adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities (IPCC. 2014). It includes all activities that help people and ecosystems reduce their vulnerability to the impact of climate change, and that minimize the costs of natural disasters (IFAD, 2008). According to Aguilar (2001) and IPCC (2014) adaptation can be both autonomous and planned and depend on the capacity of the adapter.

Autonomous adaptation is the ongoing implementation of existing knowledge and technology without official government or institutional interventions and policies in response to the changes in climate experienced. In other word they are individual and independent precautionary or corrective reactions in the face of adverse changes in climatic conditions, e.g. migration, plant replacement, changing time of activities and planting deep. For thousands of years t the community around Lake Chad have adapted their livelihoods to the rhythm of the annual flood. The coastlines of Lake Chad naturally shift inward and outward each year; the lake level rises in the rainy season, then recedes during the dry season. The communities are well-adapted to cope with the changes, overlapping farming with fishing and cattle-raising. Many rural communities and indigenous peoples have been maintaining a balance between natural resource use and sustainable development for centuries, adapting autonomously to natural climate changes.

On the other hand, *planned adaptation* is the increase in adaptive capacity by mobilizing institutions and policies to establish or strengthen conditions that are favorable to effective adaptation and investment in new technologies and infrastructure (IFAD, 2008). A longer-term planned approach for adaptation has to incorporate additional information, technologies and investments, infrastructures and institutions, insurances, safety nets and cash transfers to reduce vulnerability to shocks and integrate them with the decision-making environment. Technical options of planned approach include many forms of land use and land use change, new cultivation practices, new seed varieties, appropriate incentive structure, such as targeted payment for environmental services, which can expand the options that poor communities and indigenous peoples can have for both adaptation and mitigation (IFAD, 2008).

Adaptive capacity is the ability of communities and individuals to adjust to climate change, to moderate potential changes, to take advantage of opportunities or to cope with the consequences. The adaptive capacity of individuals or social groups varies, and is dependent upon their access to and control over resources. (Building Nigeria's Response to Climate Change (BNRCC), 2011). Key risks and risk levels vary across regions and over time, given differing socioeconomic development pathways (health, wealth, education, employment, 35 political process and participation), vulnerability and exposure to hazards, adaptive capacity, and risk perceptions (BNRCC, 2011).

The Post Disaster Need Assessment (PDNA) Report of Nigeria following the 2012 flood revealed that the total damage caused by the disaster amounted to $16.9 billion, representing 1.4% of real GDP growth in that year. In this regard, climate change poses a significant threat to the achievement of development goals, especially those related to eliminating poverty and hunger and promoting environmental sustainability.

Nigeria adopted the National Adaptation Strategy and Plan of Action on Climate Change in 2011, and the Nigerian Climate Change Policy Response Strategy 2012. This Plan of Action identified 13 priority sectors impacted by climate change in Nigeria. These sectors include agriculture (crops and livestock), freshwater resources, coastal water resources and fisheries, forests, biodiversity, health and sanitation, human settlements and housing, energy, transportation and communications, industry and commerce, disaster,

migration and security, livelihoods, vulnerable groups, and education. The NASPA-CCN allocates concrete responsibilities to all stakeholders including the federal government, state governments, local governments, civil society organizations, international development partners, communities and organized private sector with the government, the private sector, and civil society providing strong and visionary leadership. The NDC emphasizes that Nigeria that the 2014 World Climate Change Vulnerability Index, classifies Nigeria as one of the ten most vulnerable countries in the world.

The situation of calculating cost for adaptation is compounded by the fact that Nigeria is yet to undertake a detailed adaptation cost estimates for its effective response to climate change. Information are widely scattered, and they remain largely conjectural.

Adaptation costs are understood to be the "costs of planning, preparing for, facilitating, and implementing adaptation measures, including transition costs" (IPCC) and the benefits are "the avoided damage costs or the accrued benefits following the adoption and implementation of adaptation measures" (IPCC).

A limitation of Cost Benefit Analysis is that it requires all benefits to be measured and expressed in monetary terms, which is often either difficult to achieve or is seen as morally questionable (e.g. assigning monetary value to human lives or "discounting" future benefits).

Stimulating flows of private finance is essential for Nigeria to meet the cost of climate change adaptation but remains a challenge as it is perceived as a government cost.

There are some specific sectors that Nigeria Government should be aware of in their policies and strategies to improve and attract more private sector financing for adaptation projects.

(i) Water Management Strategies: Adaptation along this path will require huge investments in desalination technology, increased gray water use and rainwater harvesting for crops and everyday human uses other than drinking, and flood control mechanisms to protect communities and crops from overflowing rivers. Adaptation efforts should also focus on how the infrastructure can be designed to simultaneously manage water for hydropower, agriculture and human consumption to further scale up the environmental and economic development of communities.

(ii) Agriculture: Efficient irrigation systems can help farmers in affected regions cope with the uncertainty that comes with climate change. Agro forestry is also one of the main drivers to attract private sector. More details are shared in the analysis of the 7 sectors.

(iii) Housing: The housing and construction industry must recognize its dual role of helping people cope with climate change as well as developing sustainable and efficient building practices in order to prevent

environmental degradation. There is a need to build the capacity of the construction industry to be able to step up to these critical challenges. The ministry of housing and urban development should take the lead in mobilizing the stakeholder groups to come out with innovative design models that city development control authorities could rely on to encourage, model and monitor new housing projects. Climate adaptation suggests building homes on stilts, constructing barriers around natural and artificial water bodies in populated regions and providing local or on-site energy generation technologies.

(iv) Insurance to mitigate risk: The insurance industry is already saddled with the biggest responsibility as the costs of climate change often accrue directly to them. There is an opportunity for them to leverage their position to help spread the risk of extreme weather events by encouraging adaptation behaviors through the construction of new policy clauses. These measures would come at a cost to insurance buyers but taking action today could stave off greater losses that owners would otherwise incur from infrastructure and asset damage in the future. For instance, insurance companies covering property development in coastal areas could assess the potential for sea-level rise, increased storm severity, flooding, and other climate change impacts on their clients and incorporate appropriate measures in their policy document.

(v) Weather Prediction Technology: Government institutions like the Nigerian Metrological Agency that have hitherto limited their operational jurisdiction to mere weather forecasting, should invest in technologies to enable more accurate predictions and warning systems. There is also need for accurate environmental data, particularly from sensors located in the soil, ocean, atmosphere, flood zones and arid, drought-stricken lands. It will be important to track the changes in order to have timely and quality information that will assist disaster aversion and emergency management strategies to minimize losses. Financial resources from the Ecological Funds Office, domiciled in the ministry of environment, would need to be deployed towards acquiring these innovative weather monitoring technologies.

6.3 Analysis of the 7 key sectors

Leveraging the National Integrated Infrastructure Master Plan for Nigeria (“NIIMP”), the core tenets of a green investment transformative agenda for Nigeria might include the foundational elements of sectoral masterplans all interwoven to drive critical NDC indices.

A central plank of a green investment led modernization of the economy might involve the development of climate mitigation and adaptation projects in agriculture, energy, transport and logistic water and waste management platform that creates seamless, integrated and efficient multi-modal production, distribution and consumption of goods and services.

Recognizing the cumulative deficit in public and private sector funding for infrastructure across all sectors, there is an obvious need to ramp up infrastructure investment, leveraging private sector sustainable finance.

The following sections introduce the sectoral policies in place in Nigeria concerning the seven (7) focus areas of this Study. This assessment is to examine if the private sector involvement is taking into account those sectoral climate related strategies.

6.3.1 Climate smart agri-business and forestry

The Federal Ministry of Agriculture and Rural Development (FMARD) is responsible for policy implementation in the AFOLU sector in Nigeria. The Ministry's mandate to ensure food security in crop, livestock and fisheries includes the implementation of the nation's climate smart agriculture and AFOLU policies[1]. This is done in collaboration with the Department of Climate Change of the Federal Ministry of Environment. The Climate Change unit of FMARD directly interfaces with DCC (DCC, FSV, 2019).

The FMARD policy thrust to support private sector engagement in agriculture is aimed at enhancing availability of credit for all farmers and agribusiness through stimulating cooperative banking and affordable loans through commercial banks and increasing capacity and size of market-driven guarantee and risk schemes such as The Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL Plc.) - a $500 million Non-Bank Financial Institution owned by the Central Bank of Nigeria (CBN) was created to redefine, dimension, measure, re-price and share agribusiness-related credit risks in Nigeria. It aims at pursuing legislation recognizing alternative finance mechanisms such as warehouse-receipt financing, commodity-trade financing, crowdsourcing, and private equity to deepen FMARD's capacity to facilitate agribusiness investment agreements. It includes a review of the structure of agricultural insurance markets in partnership with the Insurance Commission to intensify competition and product innovation (APP-FMARD, 2016).

The Climate Smart Agriculture (CSA) practices adopted by cassava-based farmers in Delta State, Nigeria has shown profitability. It also ascertained the differences in profits between the CSAs and then evaluated the determinants of their profits. The CSAs practiced by the farmers were crop rotation (91.8%), bush fallowing (80.0%), use of organic manure (73.3%), agro-forestry (40%) and multiple cropping (55%). It is recommended that agricultural extension services be provided to boost productivity of CSA practices in the crop farms; while policies that will encourage CSA adoption (especially agro-forestry and multiple cropping) should be put in place.

1 https://fmard.gov.ng/who-we-are/

Agroforestry will serve as a win-win solution to the difficult decision between reforestation and agricultural land use and adaptation to climate change (Fobissie et al., 2011); hence it increases the storage of carbon and may also increase agricultural productivity. Agroforestry techniques generally operate at three levels:

1. The first level, and the one currently receiving most attention internationally, is agroforestry practiced by small farmers with the purpose of satisfying family or village-level needs
2. The second level of agroforestry (AF) is that promoted by local governments, usually on a fairly large scale. Rural people are given incentives to plant trees along with their crops and care for them.
3. The third level of agroforestry consists of large-scale efforts, usually by the private sector. It is aimed at maximizing outputs (profits) on an industrial scale by the production of wood in combination with crops or livestock on a given piece of land.

The demand for energy had been found to be the major reason behind fuelwood sourcing, both in the fields or farms and in the established forests. This was found to result in indirect land use changes (ILUC) currently affecting the area. Reason for the ILUC from forests to agricultural and pasture uses due to the inability of the government to carry reforestation of the areas affected within the resources as a result of fuelwood sourcing. Also, the rapid disappearing of few trees standing in the fields coupled with intensive farming practices was found to be causing ILUC from arable to waste land, through soil exhaustion which often leads to desert conditions.

The water resources are unevenly distributed in the country, there is need for the efficient use and management of the available water resources and increasing the productive use especially in the northern region of the country where there is increasing incidence of drought and competing need for water among the different sectors of the economy. There are opportunities for water resources development in the country through irrigation to supplement the water requirements and needs of farmers for agricultural production activities in many areas in the semi-arid and arid regions.

Agriculture's linkages with other Sectors – focusing policy instruments on the connected relationship between agriculture and other sectors at federal and state levels, particularly industry, environment, power, energy, works and water sectors.

Traditional agricultural lands have potential to sink and absorb large quantities of carbon through the trees originally present on the land as well as those introduced. Thus, agroforestry is becoming widely recognised not only in terms of agricultural sustainability but also in issues related to climate change adaptation and mitigation.

The National Forest Policy of 2006 depicts the issue of climate change and deforestation. It also explains the major role of the private sector in forestry, particularly in the production and processing of wood products and in ecotourism, which are major employers and which require good business management. The practice of agroforestry in Nigeria is increasingly receiving attention. It was one of the key sectors financed by the Nigeria Green Bond (Refer to section 8.3 below for more details) and Nigeria is engaged in several other agroforestry programmes such as Africa Soil Information Service (AfSIS) Phase II, Promoting Rural Innovations through Participatory Tree Domestication in West and Central Africa, and the Promoting Development of Economically Viable Rubber Smallholding in West Africa.

6.3.2 Transport and Infrastructure

The Federal Ministry of Transport (FMT) is responsible for most transportation-related policy-making and implementation in Nigeria, overseeing parastatals including the Nigerian Airspace Management Agency, Federal Airports Authority of Nigeria (FAAN), Nigerian Civil Aviation Authority (NCAA), Nigerian Maritime Administration and Safety Agency, Nigerian Railway Corporation (NRC), Nigerian Ports Authority, Nigerian Shippers' Council, and National Inland Waterways Authority, among others. Recent transport investment has been guided by two major policy documents – the Nigeria Integrated Infrastructure Master Plan (NIIMP), running from 2014 to 2043, and the Economic Recovery and Growth Plan (ERGP), a mid-term macroeconomic development agenda covering the period from 2017 to 2020.

There is general consensus that capital infusion in physical infrastructure -comprising rail, road, ports, power, water and sanitation are crucially important to increasing real sector capacity. The most critical area of the real sector that can benefit from an infusion of capital is infrastructure.

Clearly, the development of functioning and public transport markets in Africa will be fundamental to these efforts since transportation is not only important to economic growth and job creation, but critical to providing financeable roadmap to Africa in achieving the SDGs (particularly goal #7), and contributing meaningfully to the Climate Change mitigation effort.

A critical performance indicator and visible measure of competitiveness, and ease of doing business is the World Bank Logistics Performance Index (LPI) which measures six key dimensions to benchmark countries' performance on six indicators: efficiency of the clearance process, quality of trade and transport related infrastructure (e.g., ports, railroads, roads, information technology); ease of arranging competitively priced shipments; competence and quality of logistics services, ability to track and trace consignments; and timeliness of shipments in reaching destination within the scheduled or expected delivery time. Going by these measures, Nigeria has consistently ranked as inefficient despite efforts to improve its operational effectiveness.

The centerpiece of the private sector led green/climate infrastructure plan is - Regional Connectivity. The goal of which is to develop hubs of logistics and distribution multimodal platforms capable of facilitating the seamless distribution of agriculture, manufactured goods imported or destined for export.

To address the high incidence of post-harvest loss in farm communities, Nigeria supports road transport developments in: connector roads, local roads and feeder roads. These arteries of feeder, connector roads aggregate to proposed rail lines across the Middle Belt 'bread-basket' and are integrated into Inland Water Transport Networks. Inland waterways represent a low cost, green, efficient and decarbonizing means for transporting bulk goods.

6.3.3 Green Buildings and Smart Cities

The Federal Ministry of Works and Housing is responsible for building regulations and categories of infrastructure development that are not reflected in other ministries. Nigeria does not have a Green Building Assessment Tool (GBAT) but the Leadership in Energy and Environment Design (LEED) seems to be the unofficially accepted standard (Atanda, 2019). Green Building Council of Nigeria (GBCN), National Building Efficiency Code, Nigeria Building Code (NBC), and National Adaptation Strategy and Plan of Action (NASPA) are the existing green building policies in Nigeria. A recent study found that the existing green policy is not fully implemented due to the lack of government and leadership political will, policy compliance and enforcement, and lack of public awareness of green practice benefits among others (Abisuga et al., 2020).

Mitigation actions are tailored to air-conditioning and refrigeration with a focus on standards for imported equipment particularly in air-conditioning and refrigeration where there is a risk of dumping of HCFC and HFC installations that are being phased out in accordance with the Kigali Amendment to the Montreal Protocol which has been ratified by Nigeria and came into force in January 2020 (Abisuga et al., 2020). Adaptation actions are reflected in sustainable urban planning with specific actions in discouraging building/urban encroachment into vulnerable areas, high risk zones & low-lying areas; discourage housing and settlement practices that are maladaptive in the face of climate change; and strengthen rural settlements in order to reduce migration (WBG, 2016).

6.3.4 Power : Oil & Gas, Renewable Energy and Energy Efficiency

The Federal Ministry of Power is the policy making arm of the Federal Government with the responsibility for the provision of power in the country. The Ministry in discharging this mandate is guided by the provisions of the National Electric Power Policy (NEPP) of 2001, the Electric Power Sector Reform (EPSR) Act of

2005, the Roadmap for Power Sector Reform of August 2010 (FMP[2]) and National Renewable Energy and Energy Efficiency Policy (NREEEP) of 2015. Mitigation actions include: 2% per year energy efficiency (30% by 2030); promote use of efficient gas generators and work towards ending gas flaring by 2030; build multi cycle power stations; use of natural gas rather than liquid fuels; decentralized renewable energy; enforced energy efficiency; and blending fuel ethanol with gasoline and biodiesel with petroleum diesel for transportation fuels (AfDB Climate Profile, 2019).

Solar appears to be the most promising renewable energy source for Nigeria, given the location of the country within the heart of the tropical region where the sunshine and solar radiation are very abundant and well distributed. Nigeria's average annual solar radiation ranges between 25.2 MJ/m^2/ day in the north and 12.6 MJ/m^2/day in the south. With an average sunshine of 6.5 hours per day, the available annual solar energy is about 27 times the country's total fossil fuel resources and over 115,000 times the electrical power generated (Bamisile et al., 2017).

The NDC target is to generate 13,000 MW of clean energy through solar is directed at off-grid, small-scale, pay-as-you-go model. This approach aims at laying less emphasis on the grid-paradigm and investing in the provision of energy for poor communities (NDC, 2015).

The Oil and Gas sector accounts for about 10 % of Gross Domestic Product (GDP), and petroleum exports revenue represents around 86 % of Nigeria's total export. The Federal Executive Council of Nigeria, seeks to develop a petroleum industry in which value added services in upstream, midstream and downstream can be realized combined with a move towards a gas based industrial economy. However, "…the future for oil producers lies in developing value-add sectors of refining and petrochemicals" given the volatility in oil and gas prices. The basis of National Petroleum Policy (NPP) is to minimize the environmental footprint of oil exploration in Nigeria. The policy recognises the importance of private sector players, such as international oil and gas companies (IOCs), international independents, national independents, oil and gas service companies, independent power plants (IPPs) and project developers, the environmental policies and strategies.

The pivotal role of the Oil and Gas sector in Nigeria's economy and the impact of gas flaring on meeting the emission commitment in the NDC may have informed the focus on emission reduction through seeking alternative operational approaches in the Oil and Gas industry. An estimated 13.4% of the projected emission reduction (by 2030) is expected by ending gas flaring and an additional 21.42 % through effective gas power stations. Nigeria hopes to achieve this critical aspect of the NDC through improved enforcement of gas flaring restrictions, development of Gas-to-Power at gas flare sites. Mitigation approaches include

[2] http://www.power.gov.ng/about-nigeria-federal-ministry-of-power/

blending 10% by volume of fuel-ethanol with gasoline and 20% by volume of biodiesel for transport fuels. This presents green investment opportunities for the private sector in Nigeria. This approach aligns to the establishment of Renewable Energy Division (RED) of the Nigeria National Petroleum Corporation (NNPC) in 2005 to pioneer and coordinate the development of the Automotive Biofuels Industry in Nigeria and to be a leading player in renewable energy business towards a low carbon economy. RED was also mandated to provide alternative energy by profitably exploiting Renewable Energy sources, such as solar, wind and waste-to-energy and generating carbon credits through emissions reduction projects in Nigeria for the benefit of NNPC and other Stakeholders in Nigeria. Another aspect of its mandate includes the Coordination of Oil & Gas Sector activities to address Nigeria's NDC towards the Paris Agreement on Climate Change.

Adaptation actions include increased protective margins in construction and placement of energy infrastructure (i.e. higher standards and specifications); undertake risk assessment & risk reduction measures to increase resilience of the energy sector; strengthen existing energy infrastructure, in part through early efforts to identify and implement all possible 'no regrets' actions; develop and diversify secure energy backup systems to ensure civil society has access to emergency energy supply; and expand sustainable energy sources and decentralize transmission in order to reduce vulnerability of energy infrastructure to climate impacts (AfDB Climate Change Profile, 2019). The projected emission reduction from renewable energy is 31 million tonnes per year by 2030 (NDC, 2016).

The pre-eminent role played by Nigeria's Oil and Gas industry, that is increasingly off-shore and deep sea, often conflicts with aspirations to cultivate a "blue economy" leveraging its ocean and marine assets. The delicate balance between oil and gas exploration both near- shore and offshore, and blue economy sectors such as fisheries and eco-tourism needs to be struck.

6.3.5 Water and Irrigation

The Federal Ministry of Water Resources is responsible for developing and implementing policies, projects and programmes that will enable sustainable access to safe and sufficient water to meet the socio-cultural, environmental and economic development needs of all Nigerians[3]. The National Water Policy is the main policy in this sector.

Adaptation actions include: intensifying programmes to survey water quality and quantity for both ground and surface water; implementation of programmes to sustainably extend and improve water supply and water management infrastructure. It also seeks to explore water efficiency and management of water demand, particularly in Sahel and Sudan savanna areas; and to increase the use of irrigation systems that

3 https://waterresources.gov.ng/mandate/

use low amounts of water; to increase rainwater & sustainable ground water harvesting for use in agriculture. Under the Watershed and River Basin Management, key adaptation action is to initiate a national programme for integrated water resource management at the watershed level (WBG, 2016).

6.3.6 Waste Management

Nigeria is suffering from mass dumping of waste and waste management problems cut across concerns for human health, air, water and land pollution among others. Underground water is also being polluted through seepage from waste dump sites. Poor water quality affects people, the economy and the environment. This is a major health risk. These two sectors were not marked as a priority in the first Nigerian NDC. Therefore, the water and waste management sectors are being added in the revision to ensure greening the waste sector.

The Federal Ministry of Environment through departments and agencies is responsible for policy and implementation of waste management in Nigeria. The National Environmental Regulations Policy and the National Environmental Sanitation Policy provides the policy guidelines for effective, efficient and sustainable waste management strategies in Nigeria (Policy Guidelines on Solid Waste Management 2006). Mitigation and adaptation actions revolve around “Reduce, Reuse, Recycle and Dispose”. There are some challenges in classifying actions into mitigation and adaptation since the process cuts across ten major waste source classifications (Sridhar, et al., 2017). The National Environmental Standards and Regulations Enforcement Agency (NESREA) was established by law in 2007, the agency is responsible for all waste management issues and has a specific regulation on Sanitation and Waste control since 2009.

6.3.7 Financial Sector

In December 2017, Nigeria issued its first sovereign green bond. Its approach in issuing the bond drew on a wide network of partners through its green bond advisory group which developed the policy platform and the institutional framework to achieve this objective. At issuance, the green bond was the first sovereign green bond in Africa, and the fourth globally. The issuance of the green bond aligned to Nigeria’s strategic intent in achieving a key target in program 47 of its national development plan, the Economic Recovery and Growth Plan (ERGP), which seeks periodic issuance of green bonds to fund environmental projects. The identified projects are expected to have themes that overlap with its NDC (FGN Green Bond, 2019).

7. PRIVATE SECTOR INVESTMENT IN NDC IMPLEMENTATION

7.1 Private sector context

The informal sector makes up as much as 60% of Nigeria's economy sector and is characterized by a proliferation of Micro, Small and Medium Enterprises (MSMEs). However, majority of the jobs in the informal sector MSMEs fall outside of formal wage employment. This relatively high share of non-formal wage employment in MSMEs offering little in terms of benefit or security is a contributing factor to vulnerability and financial distress with negative consequences for Nigeria's economy.

Formal wage employment in Nigeria averages 18 % in the recent five years and provides a good indication of how well or poorly the private sector is at driving employment-led economic growth. Going by this measure, Nigeria's private sector struggles to absorb new entrants to the labor market by creating quality jobs.

On the basis of sectoral contributions to Nigeria's GDP, the following dominant sectors emerge: agriculture; 52 %, trade; 10 %, ICT; 8 %, manufacturing; 7 %, extractive industries; 6 %, construction; 5%, real estate; 4 %, finance and business services; 4 %, transportation; 1 % and others; 3 %.

Nigeria's economy and private sector are susceptible to fluctuations in the international price for crude oil – a commodity that accounts for 90% of exports and badly needed foreign exchange. In light of COVID-19 induced contraction in global trade, Nigeria will have to compete with other regions of the world for investment capital, especially green investment. This is an opportunity for Nigeria to undertake critical reforms and fast-track stalled "ease of doing business" initiatives aimed at improving its attractiveness for investment capital.

COVID-19 induced economic slowdown might force a rethink of the fossil fuel based Nigerian economy. Characterized by gas flaring by the dominant oil and gas industry, plume emitting inefficient cars and trucks, unreliable power grid supplemented by diesel powered generators and perennial traffic gridlock caused by inadequate road network. Climate mitigating and adapting approaches present opportunities to address the myriad of binding constraints arising from its epileptic infrastructure.

Now more than ever, aligning the Net International Investment Position (NIIP) with green/climate approaches offer a cost effective and sustainable approach to kick-starting economic growth in a post-COVID-19 world.

Weakness in Nigeria's real sector[4] manifests in indicators, that reveal the fact that economic growth is not correlated with employment growth, especially growth in formal wage jobs. Nigeria is challenged by its inability to transform financial assets into productive assets that can drive sustainable growth of the real sector.

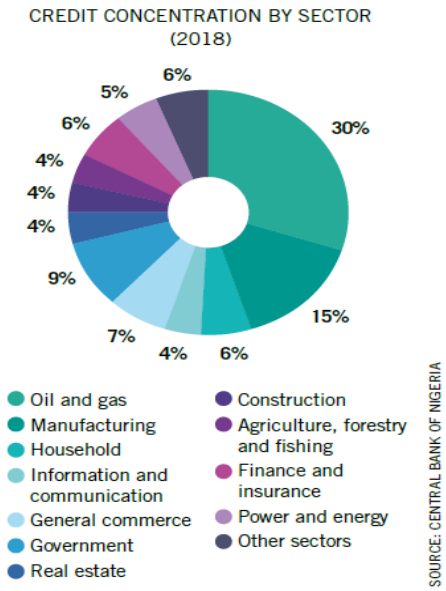
Lacking a competitive real sector foundation, Nigeria's private sector exhibits limited integration with Global Value Chains (GVCs) that drive production, distribution and consumption of goods and services across the globe. The prospects for the development of a green economy in Nigeria are severely hampered by the weak fiscal position of the Federal Government, its inability to channel financial assets into the development of a competitive real sector and support of a nascent green economy.

Considering institutional investor investment allocation, key obstacles to investing in Nigeria's green economy that affect private sector participation include, but not limited to, risks related to lack of information on market activity deals, limited exit opportunities for institutional investors, lack of scalable enterprises due to a proliferation of MSMEs and long holding period for portfolio companies weigh heavily on investment attractiveness. Additional challenges arising from uncertain legal and regulatory environment as well as an unfavorable risk vs. return profile of green investments when compared with non-green investments register as constraints.

7.2 Key Players that can motivate Climate Action

Nigeria has a vibrant financial industry and capital raising ecosystem that boasts of Impact investors, Private Equity, Fund Managers, Accounting and Transaction Advisory firms, Pension Funds, Insurance Companies and Law Firms, Sovereign Wealth Fund, Stock Exchange and Securities and Exchange Commission.

[4] This comprises households, non-financial organisations and Non-Profit Institutions Serving Households (NPISH) involved in the production and distribution of goods and services (from a combination of factor resources), necessary to meet the consumption demand of an economy.



Nigeria's banking system relies on short-term savings for deposit mobilization. This feature limits banks' ability to extend credit to long-term investment projects and green investment, further complicated by the risk of interest rate volatility and currency devaluation. Private sector investors grapple with multiple challenges as they consider Nigerian market for green investment.

Sectoral allocation of domestic credit by Nigeria's financial system indicates oil and gas dominates with 30 % allocation followed by manufacturing: 15 % and agriculture at 4 % as per figure below from the Central Bank of Nigeria.

A number of early stage ventures have emerged to provide innovative approaches to funding leveraging FinTech enabled crowdfunding by reducing embedded transactions costs while improving risk allocation. Innovators provide critical funding to sectors such as agriculture or other sectors that are crucial to driving attainment of Nigeria's NDC goals. For instance, in order to improve agricultural productivity, ambitious entrepreneurs have stepped in to provide mechanized farm equipment such as tractors to farmers on-demand deploying Apps to manage the reservation and scheduling of tractors.

Other entrepreneurs have piloted novel solutions to urban waste management using proprietary Apps to connect residents/clients and waste management collection firms. This approach promises a climate adapting path to reduce GHG and emissions.

Some of the issues affecting Nigeria's attractiveness for green investment include:

- domestic availability and depth of green funding instruments;
- lack of exit options for investors; instrument for non-recourse loan risk mitigation, risk vs. return profile – currency and tenor matching;
- lack of corporate and consumer tax incentives for green investment;
- lack purchase of green product and regulatory policy risk.

Symbolically, a near-term action that can be undertaken to signify government's support for private sector and green investment, could be a conferment of Pioneer status by the Nigerian Investment Promotion Council (NIPC) on green investment will go a long way in boosting the attractiveness of Nigeria as a destination for green investment. Such a designation of Pioneer Status Incentives ("PSI") extends incentives designed to reduce the cost of doing business in Nigeria by providing corporate income tax relief for two years to qualifying companies making investments in industries designated as "pioneer".

To address the challenges faced by investors in acquiring critical capital equipment required for green investments and aid the seamless acquisition and installation of critical inputs for green investments that advance NDC attainment, incentives such as: zero import duty tariffs; exemption from Value Added Tax for green investments; and tax concessions/holiday for re-invested profits would be helpful.

7.3 The reasons the private sector should be involved in NDC green investment

With an ever-growing population, especially in densely populated urban cities, green investments offer tremendous opportunities to develop of labor-intensive and cash flow generative enterprises to sufficiently absorb the growing number of new entrants to the labor-market.

Nigeria's private sector can lay out a more competitive real sector by developing an integrated green approach with a green-centric Global Value Chain that contributes sustainable inputs and raw materials towards the production, distribution and consumption of goods and services across the globe.

An emerging body of experience suggests considerable potential exists for closing the green investment gap by mobilizing private finance through the targeted deployment of public finance. It is crucial to reform policies and incentives to give the right signals to investors, providing a strong enabling framework for investing. In parallel, private sector investment can be achieved by using a range of proven instruments and mechanisms to help reduce the cost of capital and investment risks.

Significant barriers exist to securing the required scale and pace of progress. The challenges described are identified in the section below. The continuing global economic crisis has dimmed longer-term outlooks by business and governments. Financing for much-needed infrastructure is constrained by limits in public finance, policy and market uncertainty and the unintended consequences of financial market reform. Furthermore, legacy fiscal measures such as fossil-fuel subsidies combine with the slow progress of international climate negotiations to weaken market signals that might otherwise incentivize green investment. Lack of awareness of private finance providers of green growth opportunities and continued investment in fossil-based resources are restricting progress.

An analysis of sustainable finance opportunities in Nigeria, estimates sustainable investment in Nigeria is $92 billion annually out to 2030, presenting an opportunity for private sector investment in green development of more than $10 million every hour (UNEP, 2018). The investment opportunities are linked to renewable energy systems, agriculture and land use, health care, education and transport. The analysis also identified circular economy business models and digital infrastructure as sector investment opportunities.

NDC adaptation and mitigation strategies present the platform for new business opportunities for the private sector due to the trajectory to renewable energy and energy management, water saving expertise, waste management, transportation and other major infrastructure, as well as insurance and risk management (IFC, 2016).

NDC implementation aligns with the global direction to green development as evidenced by the volume of $300 billion invested annually to improve the efficiency of power grids, transport, industry, and buildings. It is estimated that by 2050, the need for infrastructure services such as water, waste, sanitation and urban transport solutions would surge, creating investment opportunities for the private sector (IFC, 2016).

Data from the Nigeria Bureau of Statistics indicates that within the last five years, the small and medium scale enterprises (SMEs) in Nigeria have contributed about 48% of the national GDP. The SMEs, about 17.4 million in number, account for about 50% of industrial jobs and nearly 90% of the manufacturing sector (Nigeria SME Survey, PWC).

NDC green investment presents the opportunity for business expansion in climate-resilient infrastructure design, development, implementation and innovation. NDC green investment opens up the need for innovation and new green and inclusive business models and also provides opportunity for companies to contribute to green growth and climate action on a profitable basis, by developing new products and services, diversifying their business streams, as well as reaching new targets.

7.4 SWOT Analysis for Nigeria's private sector NDC green investment

STRENGTHS	WEAKNESSES
• Nigeria has a vibrant financial industry and capital raising ecosystem that boasts of- Impact investors, Private Equity, Fund Managers, Accounting and Transaction Advisory firms, Pension Funds, Insurance Companies and Law Firms, Sovereign Wealth Fund, Stock Exchange and Securities and Exchange Commission. • Recent advances in Digital Technology offer innovative approaches to overcoming some of the physical and geographic barriers to inclusion for under-served populations bolstering resilience. • New financial instruments, especially project finance, and the globalization of private investment funds, can play a major role in the expansion of the green investments such as green bonds launched in December, 2017 in Nigeria	• Policy conflicts as reflected in massive budgetary subsidies for fossil fuels deprive critical mass transportation and renewable energy sectors of badly needed investment. • Inability to de-risk agriculture dominated by small farm lots/holdings starves agriculture of credit and sustainable finance led investment. • Lack of awareness of opportunities for green investment exists within the private sectors in Nigeria. • The process of engaging with the government on green investment in Nigeria presents bureaucratic bottlenecks.
OPPORTUNITIES	**THREATS**
• The Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL Plc.) - a Non-Bank Financial Institution wholly-owned by the Central Bank of Nigeria (CBN) was created to measure, re-price and share agribusiness-related credit risks in Nigeria. • Recognizing the cumulative deficit in public and private sector funding for infrastructure across all sectors, there is an obvious need to	• Crumbling infrastructure that registers lowly in the World Bank's Logistics Performance Index ("LPI") causes delays, higher costs for haulage and mounting losses for importers and exporters. • Macro-economic risks to investing in Nigeria include, but not limited to, currency volatility arising from foreign exchange scarcity leading to rationing and capital controls.

ramp up infrastructure investment, leveraging private sector sustainable finance.	• Additional threats arising from – inadequate availability of information on market activity deals, limited number of scalable enterprises caused by a proliferation of Micro/Small Enterprises, and long holding period for portfolio companies weigh heavily on Nigeria's investment attractiveness • Similarly, other challenges that register as hurdles to potential investors include weak corporate governance, limited exit opportunities; lack of depth in the green investment fundraising environment; and shortage of qualified human capital. • The initial investment in green technology such as solar energy, green houses and adaptation to green practices and processes is high. This is a barrier for private sector investors. • Climate variability impacts the reliability of data used to plan future investments increasing stranded asset risk due to under-performance or cost overruns of projects. • Limited understanding of climate change adaptation or mitigation measures that benefit businesses and society calls for capacity training on climate change and public dialogue.

7.5 Examples of private sector green investment for NDC implementation

This section presents examples of current private sector green businesses developed in Nigeria in each of the 7 sectors area of focus of this study. These projects are successful examples that are aligned with the priorities set in the Nigerian NDC.

7.5.1 Financial Sector

NIGERIA GREEN BOND				
OBJECTIVE	SECTOR	AMOUNT $ MILLION	M, A OR M/A	IMPACTS
• Kick-start the Green Bond market in Nigeria, • Greening of Federal Government debt portfolio and budget. • Leverage pilot to mobilize private sector issuance of Green Bond. • Sensitization of finance operators. • Reduction if FG share of fixed income market with larger representation from private sector issuers	• Energy • Agriculture • Afforestation • Transportation • Water and irrigation	• Series I – 30.54 • Series II – 42.50	• M • A • M/A	• Provide funds for climate-resilient projects in Nigeria. • Signal Government's commitment to protecting the environment and climate change.

ACCESS BANK GREEN BOND				
OBJECTIVE	SECTOR	AMOUNT $ MILLION	M, A OR M/A	IMPACTS
• Flood defense project for Victoria Island in Lagos. • Photovoltaic assets with an annual impact estimated at GHG reductions of 11,361 tCO2eq/y. Installed renewable energy capacity of 14.31 MW.	• Energy • Infrastructure	• 42.50	• M • A	• Renewable energy generation of 23,817 MWh/y. • 900 hectares protected from flooding. • 400,000 beneficiaries protected against flooding.

NORTH SOUTH POWER GREEN BOND				
OBJECTIVE	SECTOR	AMOUNT USD MIL	M, A OR M/A	IMPACTS
• Refreshment of a section of Shiroro Hydroelectric Power Plant. • Generate social, environmental and economic impact, such as contributing to greenhouse gas emissions reduction, revitalizing disenfranchised areas, improving access to services and creating employment.	• Energy	• 25.00	• M • A	• Proceeds will be used to refinance past eligible green projects (for the period 2013 to 2018) as well as future eligible green projects (for the period 2019 to 2053). • Cover investments made by NSP towards hydropower generation and solar power generation

Project Name: PalmPay (Lagos, Nigeria)

Project Description: PalmPay is the Central Bank of Nigeria licensed mobile money operator offering a simple and secure payment app for sending quick cash between friends and pay for airtime and utilities. This startup was launched in 2019 and aims to become Africa's largest financial services platform. Product promises: Increased access to financial services drives the adoption of a cashless society.

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	CLIMATE CHANGE
Financial Services	Mobile money operator	$ 40 M	Debt Equity Ratio: 0/100 Seed round: $ 40 M	Adaptation

Rationale:

With improving smartphone and mobile-connectivity across Africa there is an opportunity to leverage digital financial services to address financial inclusion and increased usage of payment products for mobile-centric consumers.

Impact newly converted customers to a cashless economy interact, consume and pay for goods and services in manners that leave lower carbon footprint by shopping online and electing to have purchases delivered by more energy friendly use of parcel companies. Cashless society advances NDC objectives of lowering GHG and CO2 emission that originate from millions of consumers journeying cross town to make in-store purchases.

Sponsoring Agency/Entity:

CEO: Greg Reeves

7.5.2 Climate smart agri-business

Project Name: Releaf (Akwa Ibom, South East Nigeria)

Project Description: Help small farmers access trusted markets for naturally occurring Wild Palm to boost revenue for smallholders providing offtake for their produce (Palm Nut) during palm oil production while they harvest from the wild palm forest. A rejection of the mega-plantation palm production.

Project improves: Yield, revenue and sustainable forests while reducing waste and wildfires.

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	IMPACT - CLIMATE CHANGE
Agriculture/ AFOLU	Marketplace	270,000 $	Debt Equity Ratio: 27:73 Seed round: $ 120,000 Seed round: $ 150,000 Debt financing: $ 100,000	Mitigation and Adaptation

Rationale:

Releaf is committed to harnessing technology to power agriculture led industrialization of Africa. It's the process; not the plant that drives deforestation. The factory uses different algorithms in its operations, which ensures an efficient digital-industrial factory.

Impact: Releaf focuses on helping small farmers access trusted markets for naturally occurring Wild Palm without enforcing mono-cropping that sends species into extinction thereby ensuring long-term sustainability of Nigeria's forest resources for their climate adapting roles absorbing CO2 emissions.

Sponsoring Agency/Entity:

Data from Crunchbase indicates Releaf was a participant in Y-Combinator and has raised $370,000 to date with the last funding round being debt financing.

Founders: Ikenna Nzewi, Isaiah Udotong and Uzoma Ayogu

7.5.3 Power

Project Name: Anergy (Lagos, Nigeria)

Project Description: Anergy is a distributed utility leveraging the Internet of Things (IOT) to provide reliable solar power for businesses in emerging markets. The firm specializes in design, sale and installation of affordable and reliable, distributed energy systems.

Project improves: Businesses and economic outcomes by emphasizing on reliable solar energy for productive use and reducing OPEX costs that threaten the sustainability of our target business clusters.

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	IMPACT - CLIMATE CHANGE
Energy	Renewable Energy	$ 9 M	Debt Equity Ratio: 0/100 Series A: $ 9 M	Mitigation and Adaptation

Rationale:

Distributed utility takes load off the national grid and allows local grid activity to serve industrial zones and public good thus stimulating economic growth. Anergy provides energy services for small, medium and large businesses across our target markets via - subscription, outright sale and lease to own plans

Impact: Reducing Carbon emission and pollution in the regions and increasing energy access from the bottom to the top of the pyramid.

Sponsoring Agency/Entity: Founder: Kunle Odebunmi

7.5.4 Transport

Project Name: Kobo360 (Lagos, Nigeria)

Project Description: Kobo360 is a tech-enabled digital logistics platform that aggregates end-to-end haulage operations. Freight logistics startup that uses an Uber-like app to connect truckers and companies to delivery services. Kobo360 claims a fleet of more than 10,000 drivers and trucks operating on its app offered in languages common to drivers, such as Hausa and Pidgin.

Product promises: improve logistics efficiency and better user experience

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	IMPACT - CLIMATE CHANGE
Transport	IoT enabled logistics	$ 30 M	Debt Equity Ratio: 27/73 Seed round: $ 1.2 M Seed round: $ 6 M Debt financing: $ 10 M Series A: $ 20 M	Mitigation and Adaptation

Rationale:

Commercial research firm MarketLine estimated the value of Nigeria's transportation sector in 2016 at $6 billion, with 99.4% comprising road freight. Kobo360 is part of a growing e-logistics and transport space in Africa linking on-demand apps to mobile-based connectivity to move people and goods around the continent more effectively.

Well positioned as a cross-border freight service, Kobo360 aims to take advantage of Africa's Continental Free Trade Area (AFCFTA).

Impact: Inefficiencies in logistics do not only drive up transport costs but increase carbon footprint and CO2 emissions in Nigeria arising from sub-optimal load scheduling and un-necessary trips driving up fossil fuel consumption.

Sponsoring Agency/Entity: Founders: Ife Oyedele II and Obi Ozor

7.5.5 Waste Management

Project Name: Scrapays (Lagos, Nigeria)

Project Description: Clients engage waste collectors via USSD, Mobile and Web interfaces notifying mobile field agents equipped with our collection technology, IOT powered digital scales and Mobile carts to make appointed pick-ups within a catchment area.

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	CLIMATE CHANGE

waste management	IoT powered waste management		Debt Equity Ratio:	Mitigation and adaptation

Rationale:

Scrapays business model combines elements of recycling and technology laden with financial incentives. It uses technology to facilitate the recovery of recyclable waste in target markets. It uses a waste recovery network consisting of independent businesses and producers.

Scrapays connect individuals looking to earn extra income from using their open space as collection outlets for recyclable waste and out-of-use scrapable items while rewarding all parties per kilogram recovered.

Impact: Scrapays has recovered 103,920 Kg of scrap recyclable materials, and generated $39,334 in revenue. **Sponsoring Agency/Entity**: Co-Founder: Boluwatife Moses

7.5.6 Smart Cities

Project Name: Rensource (Lagos, Nigeria)

Project Description: Rensource develops and manages critical infrastructure that powers solar-based micro utilities in support of the digitalization and productivity growth of SMEs. Additionally, Rensource is launching its Spaces Offline to Online platform for supply-chain services, including business analytics and working capital options.

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	CLIMATE CHANGE
Smart Cities	Digitally enabled analytics and optimization	$ 26 M	Debt Equity Ratio: Seed round: $ 2.1 M Seed round: $ 1 M Debt financing: GBP 500,000 Series A: $ 20 M Venture Capital: $ 3 M	Mitigation and Adaptation

Rationale:

Rensource allows qualifying companies in Nigeria to start selling Power-as-a-Service (PaaS) to their customers. The firm offers a striking example of a leapfrog technology business bypassing Nigeria's deficient electricity grid at lower initial capital outlays as compared to energy infrastructure projects.

Rensource success lies in its core expertise in managing a balance sheet financing the solar-hybrid systems, and a credit operation underwriting and servicing the monthly collections from final customers.

Impact: Reliable clean energy and affordable prices with 178,376 litres of fuel saved and 322.00MT CO_2 emissions avoided.

Sponsoring Agency/Entity: Founders Ademola: Adesina, Jussi Savukoski

7.5.7 Water and Energy

Project Name: Dadinkowa Hydro Electric Power Project, Gombe State.

Project Description

Dadin-Kowa Hydro Electric Power Project Concession: Design, construct, install, operate and maintain a hydro-power generating facility with an aggregate contract capacity of 39MW at Dadin Kowa 3 Dam in Gombe State pursuant to this Concession granted by the Authority in line with the PPA entered into between the Federal Government of Nigeria and the Company Contracting Authority: Federal Ministry of Water Resources on behalf.

SECTOR	BUSINESS MODEL	VALUE ($ MILLION)	FINANCING STRUCTURE	CLIMATE CHANGE
Energy	Concession. PPP	70.00	Debt Equity Ratio: 60% Debt, 40% Equity	mitigation and adaptation

Rationale for concession:

The project was conceptualized for the design, rehabilitation, operation, maintainance (recover capacity and provision of ancillary services). Hydropower is a clean, efficient, and dependable source of electric power at affordable prices. The technology for small hydro is mature and has been in use for decades. The project requires the operation and maintenance of the existing capacity of the power station, to restore generation capacity, which is currently damaged, and to design, construct, operate, and maintain new generation capacity and comply with the performance requirements and standards detailed in the agreement

Impact:

Sponsoring Agency: Federal Ministry of Water Resources

8. LANDSCAPE OF CLIMATE INITIATIVES IN NIGERIA

8.1 The role of development partners

The development partners assist in filling the financing gap through traditional aid (grants and loans); facilitating access to new financing instruments such as climate finance instruments; promoting foreign direct investments; promoting trade and enterprise development; and promoting economic diversification and inclusive growth. They also provide technical assistance, capacity development and expertise in specific areas and promote science, technology and innovation to support sustainable development (UNDP, 2017). The donors who are active and present in Nigeria are:

United Nations Children's Fund (UNICEF), United Nations Population Fund (UNFPA), African Development Bank (AfDB), International Fund for Agricultural Development (IFAD), Department for International Development (DFID) , Japan International Cooperation Agency (JICA), Canadian International Development Agency (CIDA), European Union (EU) ,German Organisation for Technical Cooperation (GTZ), World Bank (WB), World Health Organization (WHO), United Nations Development Programme (UNDP).

Due to the importance of the role of development partners in sustainable development in Nigeria, the federal government, in continued efforts at strengthening partnerships and broadening stakeholder participation in national Sustainable Development Goals (SDGs) programmes, inaugurated the Donors' Forum on the Implementation of SDGs in 2017 (UNDP, 2017).

Furthermore, the NDC Support Programme links closely with complementary projects to strengthen outputs and ensure comprehensive responses to government needs with the GEF-led Capacity Building Initiative and Transparency (CBIT). At the global level, the Programme is engaged in a range of strategic partnerships including the IKI NDC Support Cluster. (NDC Support Programme, UNDP, 2018)

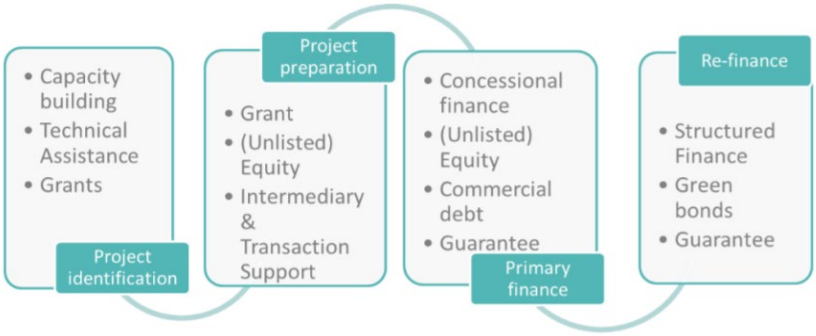
The UNDP announced its partnership with IRENA, the Green Climate Fund and Sustainable Energy for ALL on the Climate Investment Platform (CIP) which has the objective of decluttering the climate finance landscape and providing integrated and streamlined support to developing countries, emerging economies and the private sector. The CIP uses a coherent and integrated approach that leverages synergies among key partnerships to deliver a more effective, measurable, implementable and replicable climate development impact.

8.2 Climate Finance Landscape

Dedicated climate funds typically allocate funding to projects through a transparent and competitive process open to organizations from many different countries. Recipient countries or project developers submit project proposals to the fund which demonstrate how the project contributes to achieving the fund's strategic objectives. The fund then reviews each proposal and those that score the highest in a given funding round are approved for finance. The level of funding provided by climate funds is expected to grow significantly over time. Climate funds present the best opportunity to increase the flow of green investment for Nigeria in the short to medium term.

The Climate Finance instruments finances various stages of the project cycle, the figure 1 below presents each stage of the supply chain.

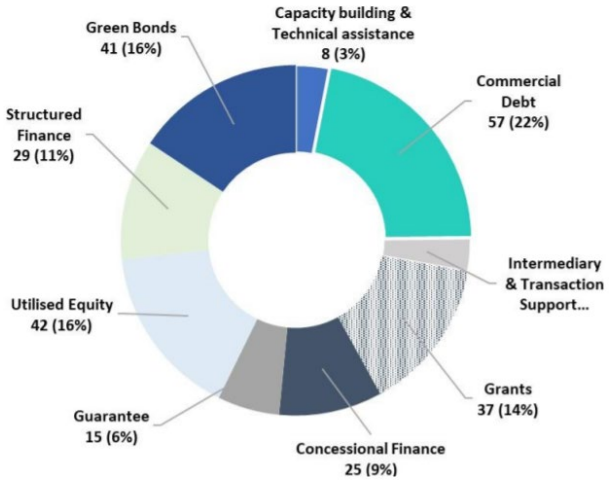
Figure 1: Climate Finance Supply Chain



Source: Climate Finance Accelerator, 2019

The most common types of support provided by the identified funding bodies, as shown in the Figure 2 below are commercial debts (22%), equity (16%) and grants (14%). This indicates that key components of primary finance for the types of project required to implement the low-carbon transition, are already present in the Nigerian market. There is reasonable availability of structured finance for secondary product de-risking. There are, however, a relatively small number of providers of capacity building and technical assistance (3%) and intermediary and transaction support focused on green finance (3%) (CFA, 2019).

Figure 2: Type of Climate finance support in Nigeria



Source: Climate Finance Accelerator, 2019

Overall, the type of support is a significantly larger focus on mitigation on Nigeria with 78%. Only 3% of the funding considered focus solely on climate finance in the area of adaptation (CFA, 2019).

Below is a non-exhaustive list of climate Funds that Nigeria actors can get access for financing, the tables specify the focus area of the fund if it is mitigation, adaptation or both, the amount as well as the key sector of priority. The Table 1, 2 and 3 list the multilateral funds accessible to Nigeria. However, the amounts represent the size of the fund which usually covers many countries (including Nigeria). The multilateral funds are divided in 3 tables: first one for the funds accessible to public and private sector actors (GCF, CIF, etc…), the second table lists the funds accessible to public sector actors exclusively and the third table presents the funds accessible to private sector. The last table 4 shows some of the domestic funds available for the private sector projects in Nigeria. In Annex 3, the table 6 refers to the GCF approved programmes for Nigeria to date.

Table 1 Multilateral Funds for Public and Private actors

CLIMATE FUNDS ACCESSIBLE TO NIGERIA	M, A OR M+A	AMOUNT ($ MILLION)	KEY SECTORS
• Green Climate Fund (GCF) / Private Sector Facility (PSF)	M+A	100 302	• Climate Smart Agriculture and AFOLU, Transport and Infrastructure, Green Building and Smart Cities, Renewable Energy and Energy Efficiency, Waste Management, Water and Irrigation and Financial Sector.
• Clean technology Fund (CTF) / Dedicated Private Sector Set Aside (DPSA)	M	5 462	• Renewable Energy and Transport
• Global Environment Facility (GEF4,5,6,7)	M	4 100	• Infrastructure, Green Building and Smart Cities, Renewable Energy and Energy Efficiency, Waste Management, Water and Irrigation and Financial Sector.
• Adaptation Fund (AF)	A	755	• Climate Smart Agriculture and AFOLU, Transport and Infrastructure, Green Building and Smart Cities, Renewable Energy and Energy Efficiency, Waste Management, Water and Irrigation and Financial Sector.
• Forest Carbon Partnership Facility - Readiness Fund (FCPF-RF)	M	430	• Forestry
• Adaptation for Smallholder Agriculture Programme (ASAP)	A	382	• Agriculture
• Nationally Appropriate Mitigation Action facility (NAMA Facility)	M	261	• Climate Change
• Dutch Fund for Climate and Development	M+A	160	• Agriculture and Water
• Le Fonds Français pour l'Environnement Mondial	M+A	120	• Agriculture, Energy efficiency, Forestry and Land-Use, Renewable Energy, • Urban, Waste management, Oceans and Coastal Resources
• Sustainable Energy Fund for Africa	M+A	95	• Renewable Energy and Energy Efficiency

Table 2 Multilateral Funds for Public actors

CLIMATE FUNDS ACCESSIBLE TO NIGERIA	M, A OR M+A	AMOUNT ($ MILLION)	KEY SECTORS
• Multilateral Fund for the Implementation of the Montreal Protocol	M	4 000	• Agriculture, Industry and Infrastructure, Health
• Islamic Development Bank's Lives and Livelihoods Fund (LLF)	M	2 500	• Energy efficiency, Industry and Infrastructure, Waste management
• Forest Carbon Partnership Facility - Forest Carbon Fund	M	1 300	• Forest and Land
• Energy Sector Management Assistance Program (ESMAP)	M	539	• Energy efficiency, Renewable Energy
• International Renewable Energy Agency (IRENA)/ Abu Dhabi Fund for Development (ADFD) Project Facility	M	1 300	• Energy efficiency, Renewable Energy
• Sustainable Development Goals Fund (SDG Fund)	M+A	290	• Agriculture, Ecosystem adaptation, Education, Energy efficiency, • Industry and Infrastructure, Renewable Energy, Rural, Transportation, • Urban, Waste management, Oceans and Coastal Resources, • Disaster risk reduction, Health, Gender, Jobs and Livelihoods, Poverty, Water
• The Carbon Fund - The Carbon Initiative for Development (Ci-Dev)	M	250	• Energy efficiency, Renewable Energy
• African Risk Capacity (ARC)	A	200	• Disaster risk reduction
• Fund for African Private Sector Assistance	M,A	87	• Private Sector
• Agriculture Fast Track Fund		24	• Agriculture
• ClimDev Africa	M	20	• weather
• Ecowas Centre for Renewable Energy and Energy Efficiency (ECREEE)	M	20	• Energy efficiency, Renewable Energy
• NEPAD Climate Change Fund	M+A	10	• Jobs and Livelihoods, Poverty
• African Climate Change Fund	M+A	11	• Readiness to climate change
• Climate Change Technical Assistance Facility (CCTAF)	M	10	• Agriculture, Energy efficiency, Renewable Energy, Waste management
• Global Climate Change Alliance (GCCA+)	M+A	5	• Oceans and Coastal Resources, Disaster risk reduction, Gender, • Jobs and Livelihoods, Poverty
• DC Support Facility	M+A		
• Global Facility for Disaster Reduction and Recovery (GFDRR)	A		• Industry and Infrastructure, Urban, Oceans and Coastal Resources, • Disaster risk reduction
• Transformative Carbon Asset Facility (TCAF)	M		• Agriculture, Energy efficiency, Industry and Infrastructure, • Renewable Energy, Rural, Transportation, Urban, Waste management

Table 3 Multilateral funds for Private actors

CLIMATE FUNDS ACCESSIBLE TO NIGERIA	M, A OR M+A	AMOUNT ($ MILLION)	KEY SECTORS
• Clean Development Mechanism (CDM)	M	2 000	• CO2 Emission Reduction
• InfraCo Africa – Sub Sahara Infrastructure Fund	M+A	1 200	• Industry and Infrastructure
• The Global Innovation Lab for Climate Finance	M	800	• Agriculture, Energy efficiency, Industry and Infrastructure, • Renewable Energy, Transportation, Urban, Oceans and Coastal • Resources, Disaster risk reduction
• Global Climate Partnership Fund (GCPF)	M	656	• Energy Efficiency and Renewable Energy
• Access to Energy Fund	M	110	• Energy efficiency, Renewable Energy
• Pilot Auction Facility for Methane and Climate Change Mitigation (PAF)	M	54	• Forestry and Land-Use, Waste management
• Green Building EDGE Program (IFC)	M		• Energy efficiency, Renewable Energy, Urban
• Universal Green Energy Access Programme (UGEAP) Bank	M	301	• Energy
• Climate Investor One (FMO)	M	821	• Energy
• Transforming Financial systems for Climate (AFD)	M	738	• Energy /Forest
• Acumen Resilient Agriculture Fund (ARAF)	M	56	• Agriculture

Table 4 Domestic Nigerian sectoral Funds for private actors

LOCAL CLIMATE FUNDS ACCESSIBLE TO NIGERIA	M, A OR M/A	AMOUNT ($ MILLION)	KEY SECTORS
• **Ecological Fund**	A	15000	• Ecological projects: soil and erosion flood control, drought, desertification and coastal zone management, as well as pollution control
• **Bank of Industry / All-On Off-Grid Energy Fund**	M	2.80	• Renewable Energy
• **Bank of Industry /Solar Energy Fund**	M	17.0	• Renewable Energy
• **Micro Finance Banks Nigeria Incentive Risk-based Systems for Agricultural Lending (NIRSAL) via**	M, A	500	• Agriculture and Renewable Energy
• **CBN Intervention Fund**	M,A	775	• Manufacturing and restructuring
• **Access Bank /Green Bond**	M,A		
• **Fidelity Bank credit lines for SMEs**	M,A		• SMEs
• **Deutsche Bank / Universal Green Energy Access Program (UGEAP**	M		• Energy

In Nigeria and many other countries, government budgetary allocation is usually the first source of financing for climate action. Unfortunately, several challenges prohibit mobilizing and accessing this source of financing. The challenges range from a lack of appreciation of the huge impacts of climate change fueled by climate change denial by many individuals and groups to competing attention from other development issues. However, from the four tables above, Nigeria has access to many sources of financing either public or private. The solution lies in part in raising awareness, particularly among policy-makers.

For Nigeria, mitigation measures have been a focus. The recent Nigeria National Adaptation Plan (NAP) Framework (June 2020) process will, therefore, continue to promote a clear understanding of the climate change phenomenon as well as the critical dangers that a lack of (or inappropriate) actions portend for the individual and the country as a whole. All avenues and channels to create or enhance this awareness will be explored. This will include engaging private sector, CSOs and extensive use of mass media and social media. (NAP, June 2020). This calls for sustained awareness and knowledge creation.

9. CHALLENGES FOR THE PRIVATE SECTOR IN GREEN INVESTMENT

There are major challenges hindering the advancement of climate mitigation and adaptation private sector involvement in green investments in Nigeria. This section focused on challenges that have been analyzed and classified in terms of enabling environment, financial, technical and environmental and social aspects.

9.1 Enabling environment: Policy and regulation conflicts

Obodo (2016) identified high cost of governance, paucity of funds and poor planning as well as corruption as major challenges facing green investments in Nigeria. Added to this, is the lack of requisite manpower and financial resources to effectively implement the policies (Ugwuanyiet al., 2013). Inability of government to fund policy implementation has been cited as one of the major challenges as well. Given these background challenges, the impact of policy and regulation conflicts on NDC implementation in Nigeria can be referenced from multiple dimensions. For example, the conflict between policies that govern fossil fuels and the renewable energy policy (Obodo, 2016).

There are no clearly defined strategies for engaging and incentivizing the private sector to invest in sectors where the government seeks their investment to achieve NDC targets.

9.2 Enabling Environment: Awareness of the private sector climate change opportunities and benefits

Pressure is mounting on both businesses and governments to act upon the climate crisis. The business case for sustainability – including environmental sustainability and climate risk management – has never been stronger. Thanks to a rising public demand and environmental awareness, the public and private sectors have a perfect opportunity to align around environmental sustainability and put this at the core of their operations.

Insufficient evidence base for successful NDC private investments.

The Climate Finance Accelerator (CFA) project has a stated goal of accelerating the transformation of NDC into climate investment plans supported by a pipeline of bankable projects provides the basis for attracting investment at scale from the private sector. A large number of the projects are related to solar power ranging from rural electrification solar power supply to parks, solar household units, and manufacturing for photo-voltaic panels.

The CFA projects as well as all the projects in section 8 of this report present examples that need to be showcased and present the benefits and the impacts.

The NDC Support Programme is also creating a database that will be fully integrated in the future national Monitoring Reporting Verification system where information can be extracted to understand the benefits.

The section 10 of this report presents opportunities in the seven (7) key sectors assessed for this study.

9.3 Financial: Access to investment deal making community for financing and match-making

Recognizing the challenges of traffic, it might be advisable for green investment promoting financial institutions/community in Lagos and other major cities to host monthly business lunches featuring business leaders, project sponsors, entrepreneurs, investors and commercial/ investment bankers to facilitate lead generation without having to spend endless hours in traffic commuting cross-city. These sessions will feature speakers engaging the audience on topical issues on climate change, business and finance.

Financial institution relationship managers can conduct follow-up telephone calls/meetings to screen prospects into their funnel conversion or host meetings for more detailed conversations about their specific funding requirements.

In order for green/climate investments to drive NDC's priorities, the following strategic operating principles/best practices should guide the transaction origination strategy:

1. be proactive rather than reactive,
2. become involved at the earliest stage of a transaction,
3. assist clients in developing their strategies and then deliver the ideas, capital, and resources to advance it, and
4. transactions must be managed by trusted partners with responsibility for protecting investor capital.

This approach aims to accelerate the pace of deal origination to diligence to financing close. And further enhanced by the inclusion of secondary market transactions in the universe of projects eligible for financing. Some brownstone, smokestack enterprises offer opportunities to retro-fit outdated production lines, electric, cooling and heating equipment to greener less carbon intensive alternatives.

9.4 Financial: The complexity of navigating the climate financial instruments

As presented in section 9 above, Nigeria has access to a lot of climate finance flow from international sources as well as regional and domestic funds as well. However, the complexity of accessing the funds is the biggest challenge, therefore, some capacity building is definitely required.

Concerning capacity-building support and technical assistance, it has been difficult for Nigerian institutions and private actors meeting the fiduciary and environmental and social safeguard requirements to access climate finance through multilateral climate funds. Also, preparing funding proposals from various funds processes remain complicated, time-consuming and unharmonized.

9.5 Technical: Understanding climate adaptation to involve private investment

It is a global difficulty differentiating adaptation from development and lack of clarity of what constitute incremental costs of adaptation and this difficulty poses a challenge to private and public actors.

However, adaptation planning and investments must include the private sector – and the sooner this happens, the better. Engaging the private sector is essential for multiple reasons. It can mobilize financial resources and technical capabilities, leverage the efforts of governments, engage civil society and community efforts, and develop innovative climate services and adaptation technologies. Private entities dominate many investments that are critical to adaptation, such as the location and design of buildings and other infrastructure investments. Private-sector corporations also develop – and often dominate – the design and delivery of many adaptation services such as weather observation technology and early warning systems. Drought-resistant seeds and other agricultural products, along with water management infrastructure and technologies, also tend to fall within their purview. Although insurance tends to be much less available and relevant to investment in Nigeria, there are already significant examples of “Cat” bonds[5] and other products that spread the risk and speed the recovery of countries after natural disasters.

[5] https://www.businessinsurance.com/article/20180314/STORY/912319829/Lassa-fever-outbreak-in-Nigeria-eligible-for-pandemic-cat-bond-World-Bank#

NDC Adaptation Toolbox[6]: This a sourcebook for adaptation planning and investment based on case study approach with real life cases. It is a good source for awareness building knowledge and capacity for valuing the costs, benefits and impacts of Ecosystem-based Adaptation (EbA).

The key enablers for understanding adaptation are: awareness raising, enhancing access to technical resources, enhancing access to finance, reforming the regulatory framework; and strengthening governance.

9.6 Technical: Insufficient capacity training on climate change for the private sector

Capacity enhancement on climate change for the private sector to enable effective engagement in NDC implementation should be addressed from a structural perspective by developing a framework that addresses climate change from both the long and short terms. Business Schools and Universities should serve as central hubs for institution-based capacity building systems, supported by strengthened partnerships and long-term financing (Khan et al.,2019). Key insights into developing a structured capacity training on climate change includes highlighting the specific capacity building needs in the NDC and adequately aligning them with the financial support system under the Paris Agreement.

Capacity Needs: Capacity needs for the private sector to effectively engage in NDC implementation includes a basic knowledge and understanding of the Paris Agreement and the NDC and how they are tied into sustainable development and national development plan. In addition, understanding the difference between mitigation and adaptation would be the basics for developing and implementing mitigation and adaptation strategies and actions. The private sector capacity needs include identifying the business opportunities in NDC implementation and developing bankable projects. The private sector must understand the role of development and donor organizations and the role they play in the green development and investment matrix. Understating climate finance, including the finance sources and how to apply for finance support is paramount in the training programs (Cooke et al., 2018).

[6] https://www.adaptationcommunity.net/ndc_adaption_toolbox/.

9.7 Technical: Lack of data on climate change

Cross-cutting challenges are a lack of adequate data as investment decisions rely on adequate data to make informed investment decisions. For example, source and adequacy of data was a major challenge in the development of the First Biennial Update Report (BUR1) for Nigeria (BUR1, 2018). Weak governance is responsible for many failures in project development and implementation and compromises in regulations. Inadequate infrastructure such as electricity, roads, waste disposal system, water etc. and lack of stakeholder inclusion in policy development and implementation are also part of the challenges.

Unlocking private finance can be challenging and needs accurate data to be able to make informed decisions to develop their businesses.

9.8 Technical: unfamiliarity of technology

Green technologies often have higher capital costs, especially during the earlier stages of development, which can further deter investors. Furthermore, they have real or perceived higher risks for a potential investor when compared with conventional fossil-based investments that have a track record of consistent returns.

Barriers to technology transfer and adoption in Nigeria starts with the absence of a Technology Needs Assessment. This deprives the nation of a credible assessment of technology gaps and so there is no Technology Action Plan (TAP) on a national level. Other barriers include cultural and traditional barriers stemming from local cultural resistance to transferred technology.

There is weak legal protection for imported technologies such as weak legal protection for intellectual property rights (IPRs) as evidenced in the Nigerian Patents and Design Act which excludes some innovations from patentability and fails to be specific on patent provisions of climate change technologies and inventions. Olawuyi (2017) noted the lack of capacity to adequately deploy and maintain transferred technologies as a major barrier. This is not unconnected to the technological educational system in Nigeria that is more theory-oriented than practical hands-on. Other barriers include: inadequate funds for climate change response including acquisition of appropriate technologies; elite apathy to Research and Development of green technologies, inadequate incentives and enabling environment for productive research (CTCN, 2018).

9.9 Environment and Social: Adherence to the Environmental and Social Safeguards law

Environmental and Social Safeguards Standards (ESS) are critical components to development projects. Private sector engaging in green development projects are required to complete the ESS section of the proposal but lack capacity for completing it.

There are environmental and social laws in Nigeria meant to protect the environment from degradation. These environmental laws include federal, state and international. However, the situation concerning environmental and social laws in Nigeria is not encouraging as there is low adherence to the laws. The low adherence is due to many reasons: problems of enforcement, indiscipline, and weak governance among the many reasons. Recommendations are made to ensure compliance with environmental and social laws to protect the environment for present and future generations (Ladan, 2017).

Gender inequalities persist particularly in the area of economic participation, and also in other sphere job positions in green economy are largely closed to women (Afolabi, et al 2017).

However, things are progressively changing like the issuance of the Nigeria Green Bond, (showcased as a pilot) which adopted the International Finance Corporation (IFC) standard in reporting the ESS for the projects financed under the Green Bond (FGN 16Bn Green Bond 2019). Typically, 40% of the jobs under the Green Bond programme was allocated to women, while 20% was allocated to men. Labour distribution among indigenous people allocated 40% to women as well and 20% to Youths. Out of the projected 45,000 jobs in the Series II GB, 18,000 was allocated to women and 9,000 to youths. Moreover, this trend has occasioned reform activities in other programmes such as the gender mainstream in the United Nations REDD+ program for the six REDD+ states in Nigeria: Cross River, Nasarawa, Ondo, Ogun, Edo and Plateau.

10. OPPORTUNITIES FOR THE PRIVATE SECTOR IN GREEN INVESTMENT

There are several opportunities but some are cross cutting sectors such as to encourage multinational and domestic corporations to embrace Environmental and Social Governance (ESG) principles. Adopting ESG scorecards in their management reporting brings added visibility and can induce the flow of institutional equity capital to firms that are aligned to the missions of fund managers. Nigerian companies can leverage the transparency to gain favorable access to global capital markets to power future growth.

The prospect for a vibrant climate finance in Nigeria depends on how rapidly large corporations embrace the benefits of touting their ESG targets in their management reporting. Importantly, tax incentives for corporate and personal tax deductions for green investment and products could jump start climate finance. Nigeria's budding FinTech, Ag-tech and other related digital technology entrepreneurs can contribute immensely to the development of climate finance.

Experiencing such demonstrable financial benefits of embracing ESG and the linkages to contributing to the advancement of NDC priorities will go a long way to fostering close engagement and collaboration between the government and private sector.

10.1 Climate Smart Agri-business

Private sector entities such as Sahel Capital offer innovative approaches to integrated value chain climate mitigating investments in agriculture. Such developments open avenues for de-risking green investment agricultural ventures, utilizing field mapping, satellite imaging, improved seed and off-take agreements to build integrated value chains. These ventures achieve higher than average yield, undertake value add processing, and are able to export the products to international markets.

Sebore Farms located in the Sebore Export Processing Zone (EPZ) in Adamawa State is a relevant example of a private sector integrated farms incorporating solar and biogas plant. Sebore is the only privately owned export processing zone (EPZ) in Nigeria and features a vision of a renewable energy hub in partnership with Nigus Investments in cooperation with German renewable solutions provider LTI ReEnergy with support of Nigerian Investment Promotion Commission (NIPC).

In advance of mechanization driven farm productivity, Hello Tractors leverages digital infrastructure to provide on-demand tractor rental business to small farmers in Nigeria in which tractor bookings is easily done over an app. NIRSAL's Farm Aggregation Model for Smallholder Agriculture based on Technology (FAM-SMART) and Agricultural Primary Production Aggregation Service System (A-PASS) aims to

integrate approximately 20 million farmers in Nigeria with offtake aggregators and commodity markets. NIRSAL deploys a base map creation -AGIX Software for field mapping and dashboard creation, leverages satellite imaging, remote sensing and NDVI technology, and UAS with multi spectral imaging capabilities.

10.2 Transport and Infrastructure

Recognizing the cumulative deficit in public and private sector funding for infrastructure across all sectors, there is an opportunity to ramp up infrastructure investment, leveraging private sector sustainable finance to deploy rail and inland water-ways for movement of goods and passengers across Nigeria.

There are opportunities for investment in the following areas financed by long-tenor green bonds:

- Connecting food producing centers in Kwara, Niger, Kogi, Benue, Nassarawa, Admawa and Taraba states to Inland River Ports at Baro, Lokoja and Ajaokuta, Asaba, Makurdi, Degema, and Oguta;
- Development of haulage, warehousing, jetties and wharfs for inland ports;
- Dredging and on key inland waterways to improve year-round navigability and installation of navigation aids for 24-hour and year-round navigation;
- Development of additional routes linking river ports to Sea Ports of Port Harcourt, Calabar, Warri and Onne; and
- Year-round dredging of Nigeria's two major rivers- Niger and Benue.

Additional climate mitigation investments and policies in the transport sector include: a shift in preferred mode of transport from car to buses; increasing use of LPG/CNG (compressed natural gas). Adaptation actions include increased protective measures in construction and placement of transportation and communications infrastructure (i.e. higher standards and specifications); undertaking risk assessment and risk reduction measures to increase the resilience of the transportation and communication sectors. Other adaptation actions include strengthening existing transportation and communications infrastructure (WBG, 2016).

There is growing awareness of the climate adaptation benefits of applying digital infrastructure to build platforms that enable users sort, sell, and dispose of solid waste for cash or points, while simultaneously scheduling pickups or drop-offs with waste merchants or disposal services.

Advances in Digital Technology – high speed broadband internet, mobile telephony, cloud infrastructure, artificial intelligence and machine learning offer innovative approaches to overcoming some of the physical and geographic barriers to inclusion for under-served populations bolstering resilience.

Importantly, digital technology can be leveraged to drive financial inclusion and growth of cashless society causing a behavior modification from in-person store purchases in favor of online purchases and home delivery with the prospect of reducing traffic, pollution and fossil fuel consumption in densely populated cities across Nigeria

10.3 Green Buildings and Smart Cities

Sustainable financing can be mobilized for private sector projects to install smart-meters in homes to reduce the incidence of electricity theft and boost payments and collections while providing demand-side load management. These measures are critical to closing crucial loopholes in the grid-based power value chain while improving financial viability of the sector through increased liquidity. By improving the revenue prospects of Nigeria's electric utilities, the power sector can attract increased investments in a diversified generation mix that features greener – hydro and renewables and smart grid more prominently.

There are significant trickle-down effects of improving access to reliable power supply that enable climate mitigating behavior interventions such as:

- Reducing cutting down of trees for firewood;
- Discouraging the use of carbon emitting – charcoal and diesel generators; and
- Increasing awareness around energy efficient appliances – light bulbs, A/C, refrigerators and cooking stoves.

The Lagos State government has initiated, formulated and executed various ICT policies aimed at transforming Lagos into a smart city. The idea is to bring efficiency to the delivery of public services; security, environmental sanitation, transportation, water systems, power supplies and government services, for example. Smart cities essentially use technology to provide services and solve urban problems. With improved and highly responsive social services provided by smart cities, citizens are given a voice and sustainability is enhanced.[7]

[7] https://businessday.ng/top-stories/article/lagos-smart-city-project-no-choice-but-continuity/

10.4 Power sector: Oil & Gas, Renewable Energy and Energy Efficiency

Nigeria's power sector is characterized by under-utilization of installed capacity and generation, broken transmission compounded by poor billing and collections by consumer facing distribution companies. This situation creates a liquidity crisis that threatens the delivery of steady power supply. Private sector opportunities exist for green investment in distributed electricity generation relying on environmentally friendly run-of-the-river hydro power plants, wind and solar. Run-of-the-river Ikere gorge dam in Oyo state and Dadin kowa dam in Gombe state represent 37 MW and 39 MW additional green energy that can be added to be grid with sufficient funding for long-delayed turbine installation.

Oil and Gas industry is a significant driver of Nigeria's economy10. In line with Nigeria's NDC, climate mitigating effects of reducing gas flaring can reduce GHG. Several capital-intensive projects offer the potential for curtailing gas flaring such as building additional gas distribution pipelines to deliver LNG to population centers to power homes and factories. In furtherance of this objective, the recent flagging off of the construction of the Ajaokuta-Kaduna- Kano gas pipeline can be viewed as a welcome development.[8]

Ability to deliver LNG to population centers offer climate adaptation benefits from behavioral shift away from domestic use of charcoal and firewood to LPG stoves. Availability of LNG in high population centers might support the development of CNG retail outlets, leveraging existing petrol station footprint, to encourage adoption of CNG powered cars as climate adapting substitutes to petrol and diesel. Such CNG powered vehicles might serve as mass transit buses in urban mass transport plans eliminating the need for inefficient C02 emitting buses.

Pay-as-you-go home solar panel firm Lumos Nigeria has been driving adoption of off-grid solar power. Nigeria Solar Capital Partners (NSCP) a renewable energy firm aims to develop and manage utility-scale solar projects in Nigeria. The firm boasts of a pipeline of 500 MW of solar projects, that positions them to play a key role in the development of sustainable and reliable power generation infrastructure in Nigeria, leveraging their team of project developers with market-leading expertise in the financing and development of solar PV projects. The goal of NSCP over the coming years is to drive investment of over $1 billion dollars into the development of utility-scale solar fields in Nigeria.

[8] https://www.vanguardngr.com/2020/06/buhari-osinbajo-flag-off-ajaokuta-kaduna-kano-gas-pipeline-project/

10.5 Waste Management

Increasing population in urban centers of Nigeria highlights the need to improve solid and liquid waste collection, treatment and disposal services leveraging private sector approaches. There are opportunities for Nigeria's private sector to explore and advance waste management investments leveraging climate adapting -bioethanol cooking fuel, waste to matter- organic fertilizer and waste to energy – biomass.

There is growing awareness of the climate adaptation benefits of applying digital infrastructure to build platforms that enable users sort, sell, and dispose of solid waste for cash or points, while simultaneously scheduling pickups or drop-offs with waste merchants or disposal services.

The Jos based start-up OkwuEco recently launched a market platform, available on Google Play, to facilitate the disposal of solid waste and encourage recycling. The platform enables users identify, sort, buy, sell, and dispose of solid waste from anywhere for cash or points, and automatically schedule pickups or drop-offs with waste merchants or disposal services. Currently seeking funding with a minimum viable product in experimental stage, the platform is expected to grow in popularity and adoption.

This framework offers possibilities to build a scalable crowd-sourced approach to aggregating urban waste management integrating residents, merchant recycling and manufacturing firms in a win-win value chain.

10.6 Water and Irrigation

Rising temperatures cause higher rates of evaporation thereby depleting dams and threatening agriculture livelihoods that depend on irrigation while limiting the dams' electricity generating capacity. Technologies for African Agricultural Transformation (TAAT) developed a pilot program that offers wheat farmers in Kano the opportunity and benefit smart irrigation offers utilizing modern pressurized water conveyance-distribution to minimize water loss and increase crop yields.

Similarly, Alliance Agriculture launched a pilot program aggregating farmers into contiguous groups and providing them access to sprinkler irrigation from center pivots. Leveraging water meters, farmers only pay the water they use, supported by a full-time farm manager to help the farmers manage the production of three crops per year, using quality seed and other inputs, providing tractor services, and applying conservation tillage practices. Nigeria, due to inadequacy of rainfall in the northern states has led to government investment in irrigated agriculture involving both large and small-scale irrigation systems.

However, there are several abandoned water projects in Nigeria including irrigations, dams and water supply. These projects were abandoned due to lack of funding. The federal government through the Green

Bonds, financed the rehabilitation of some of the projects, opening doors for investment in the sector. Estimated $ 1 million is required to complete the projects; opening doors for new ones (FGN, Green Bond, 2019). The irrigation projects in Nigeria has the potential of about 3.14 million Hectares of land suitable for irrigation with an estimated annual water demand for irrigation in wet and dry seasons at 1.926 BCM (including FADAMA) (NIPC 2. 2019).

10.7 Financial Sector

Green investments offer opportunities to execute a less carbon intensive economic development and transformation plan for Nigeria. To address concerns about the lack of information on market deals in sustainable financing, the Green Tagging Project was launched that seeks to leverage a reporting framework through which all financial institutions can report, in a homogenous manner, their financing of projects. With the goal of providing a monitoring mechanism and offer visibility to green and sustainably compliant market activities.

Efforts to achieve higher levels of financial inclusion on the basis of account ownership have been hampered by the higher cost to serve the unbanked and its lower returns on investments. Digital financial services introduce platforms for driving financial inclusion leveraging biometrics/Digital IDs for opening low Know Your Customer (KYC) transacting account for previously excluded segments of the population. Access to transacting accounts paves the way for other financial services such as payments and Peer-to-peer (P2P) transfers in furtherance of the emergence of a cashless society.

Beyond physical infrastructure, there is growing awareness of the contribution Information and Communication Technology (ICT) can make in overcoming structural barriers to economic growth and green investment led development. Advances in Digital Technology – high speed broadband internet, 4G/5G Mobile telephony, cloud infrastructure, artificial intelligence and machine learning offer innovative approaches to overcoming some of the physical and geographic barriers to financial inclusion.

FinTech innovation aids the development of a robust payment systems and infrastructure that promote financial inclusion while lowering friction that hinders access and usage of financial services and products. Thera are possibilities to leverage financial inclusion and growth of cashless society to reducing in-person store purchases in favor of online purchases and home delivery. Such a paradigm shift in consumer behavior and payments offer prospects to reduce traffic congestion, pollution and fossil fuel consumption in densely populated cities across Nigeria where millions of people commute daily to purchase goods in stores due to their lack of access to transacting accounts or platforms for shopping online.

Additional opportunities to leverage financial services innovation to driving climate mitigating behavior modification includes:

- Micro loans and Pay-As-You-Go financing for solar power/panels;
- Value chain financing in agriculture;
- Online Tax/Permits/Approvals for States/Local Government;
- Access to online Business Registration;
- Online Investment/Project Approval Platform.

New financial instruments, especially project finance, and the globalization of private investment funds, can play a major role in the expansion of the green investments. Green financial instruments for infrastructure development, are supported enthusiastically by the multilateral/bilateral development banks, development agencies, international financial community, and increasingly by the Nigerian private sector.

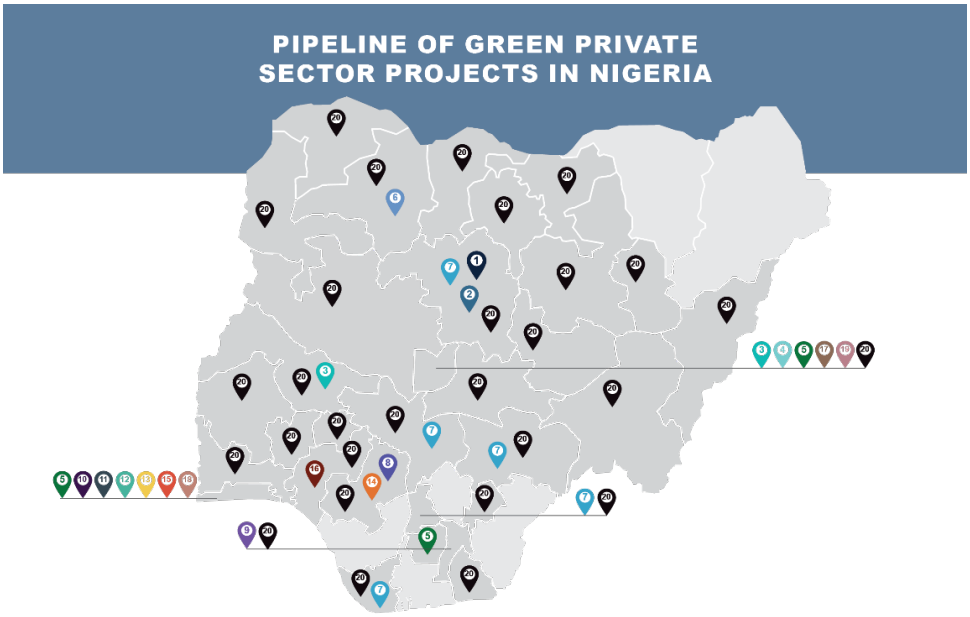
The Access Bank Green Bond provides opportunities for investment in projects that deliver sustainable development in the green space. With this bond came a new financing pool allocated to build environmental resilience, deliver on clean energy, and foster sustainable use of land. Part of the opportunities for the finance sector includes the $ 50 million facility from the Bank to Fidelity Bank Plc for the growth of Micro Small and Medium Enterprises (MSMEs). The facility is aimed at boosting the bank's capacity to promote growth of MSMEs for green development and gender inclusion (NIPC, 2019). MSME's account for 30% of Fidelity's loan portfolio (AfDB, 2018).

The National Insurance Commission (NAICOM) will need to start mitigating risks. For this, insurance needs to understand climate change issues and Nigeria specific vulnerability before they can reach out to other stakeholders in the industry. NAICOM and other stakeholders in the insurance industry must be made to understand that it is in their best interest to be more proactive and see how they can protect the entire insurance industry from the envisaged shocks of the impacts of climate change.

The Government should consider adopting the model established by the Central Bank of Nigeria in de-risking lending in agriculture by setting up the Nigeria Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL Plc.) in other sectors such as renewable energy and transport.

10.8 Mapping out identified opportunities

The map below presents the private sector green opportunities aligned with the Nigerian NDC priorities that requires financing. A table with the list of projects and its details is found in Annex 2 of this report.



1. **Kaduna Livestock Farms**
   Agriculture - $142 million - Kaduna State
2. **Kaduna Agroforestry Programme**
   Agriculture - $30 million - Kaduna State
3. **Infobyte Power Solutions**
   Energy/Agriculture - $11,95 million - FCT/Kwara State
4. **Integrated Municipal Waste Processing Complex for FCT– 2,000MTD, 16.8 MW Power**
   Waste/Energy/Agriculture - $128 million - FCT
5. **Waste to Energy Anaerobic Digester Project**
   Waste/Energy - $50 million - FCT, Lagos State, Imo State
6. **Zamfara RUGA Project**
   Agriculture/Energy - $150 million - Zamfara State
7. **Solar-Powered Rice Mill**
   Agriculture/Energy - $18 million - Kaduna State, Kogi State, Benue State, Anambra State, Bayelsa State
8. **University of Benin 15MW Solar Plant with 5 MW battery Storage**
   Energy - $15 million - Edo State
9. **Abia Integrated Municipal Waste Processing Complex 1,000MTD, 9 MW Power**
   Agriculture/Energy - $64 million - Abia State
10. **AS Finance House**
    Agriculture/Financial Services - $10 million - Lagos State
11. **Cash Converters**
    Financial Services - $10 million - Lagos State
12. **SWAgCo**
    Agri-business - $20 million - Lagos State
13. **Raven Biometric Transaction System**
    Financial Services - $10 million - Lagos State
14. **Yorkkent Castor Oil**
    Agriculture - $10 million equity - Edo State
15. **Destination Real Estate Development - PPP (Mixed Use 6 hectares)**
    Green Building/ Smart Cities - $75 million equity; $250 million debt - Lagos State
16. **Sustainable forestry and value-added timber processing**
    Climate Smart/Agri-business/AFOLU - $10 million equity; $18 Million debt - Ondo State
17. **Katampe District Phase II**
    Infrastructure - $410 million Equity Debt Rati: Construction Funding by Developer (first 18months): 5% of Project Cost & 47.5% of Project Cost - Federal Capital Territory (FCT)
18. **InfraNergy Energy Storage System for South Energyx - Eko Atlantic City Power Backup/Capacity**
    Renewable Energy/ Energy Efficiency - USD 900 K technical assistance, $5.1million equity, $11.9 million debt - Lagos State
19. **PPP Development of Abuja Mass Transit Rail Lot 1A and 3 projects for the FCTA in Abuja**
    Transportation - $91.4 million - Federal Capital Territory (FCT)
20. **Concession and leasing of grain storage facilities (33 silos across the country), to optimally operate and maintain the silos for an agreed**
    Agriculture - $10 million - Ekiti State, Ondo State, Bauchi State, Kebbi State, Katsina State, Ebonyi State, Kano State, Gombe State, Zamfara State, Oyo State, Anambra State, Ogun State, Osun State, Kwara State, Edo State, Jigawa State, Taraba State, Plateau State, Kaduna State, FCT, Nasarawa State, Kwara State, Kogi State, Benue State, Niger State, Akwa Ibom State, Abia State, Sokoto State, Akwa Ibom State, Bayelsa State, Adamawa State

11. CONCLUSIONS AND RECOMMENDATIONS

11.1 Conclusions

An appreciative inquiry approach to conducting a study for identifying the challenges, opportunities and modalities for upscaling NDC green investment in Nigeria is quite revealing. Assessment of the status of the NDC projects under the seven key sectors led to identifying gaps in private sector access to green financing for NDC implementation in Nigeria. This is underscored by the fact that the NDC implementation provides guidance and direction for building capacity for climate resilience and promoting sustainable development on a low carbon economic growth pathway for the nation. The role of DCC in this realm is critical in the NDC implementation process in Nigeria.

The national mitigation and adaptation policy framework provides adequate measures and direction for developing mitigation and adaptation projects and programmes, as well as charting the direction for harnessing the opportunities inherent in climate change adaptation activities in Nigeria. Consequently, most of the green development in the seven key sectors examined in this study are initiated and supported by government. This public sector-led approach greatly undermined the value the private sector would bring to the implementation of the NDC and green investment in Nigeria. A further dialogue with the private sector to understand the needs would be required.

The level of awareness of private sector to the challenges posed by climate change to their business is quite low, and most of them are not abreast with the opportunities presented by climate action through adaptation technologies, innovation and finance. There are mixed signals from government such as high customs duty on solar panels and support of non-climate resilient development such as coal. Concessional finance and intermediated financing to accelerate the entry of private sector financing is not at scale and so private sector access to green funding is hampered more specifically for adaptation action.

The study further revealed that most private sector entities in Nigeria are detached from local and global climate change community and so have blurred vision of the opportunities for partnerships and collaborations in the national and global climate change community that would enhance their participation in green finance.

The ease of doing business disposition of the federal government did not pay particular attention to green development. It focused on generalized logistics structure for engaging in business in Nigeria. In addition, the apparent green investment opportunities are hampered by the inability of private sector to develop early stage green project proposal: feasibility studies, business risk assessments, market studies, and bankable projects in green development.

11.2 Recommendations

11.2.1 Promotion for the private sector involvement in NDC implementation

Nigeria NDC Green Investment Promotion: The recommended modalities for promoting NDC implementation for green investment in Nigeria is based a three-stage approach: Collaboration, Attractiveness and Accessibility.

Collaboration: Awareness building dialogue between government and private sector will enable private sector highlight the need for critical climate related data. Government and investors should be concerned about the risk arising from planning approving project with limited data or variability in climate related increases investment under-performance and cost overruns. Beyond climate data variability, inadequate climate related data and resources such as weather forecasting data, lack of climate-resistant seedlings and crops; and poor socio-economic conditions make investment decisions more prone to forecast errors

Attractiveness: Developing templates for NDC investment profile would communicate the opportunities and benefits in NDC implementation. Private sector business leaders need financial indicators to justify to the Board why the organization must make a trajectory to green investment. Modalities must carefully articulate internal rate of returns, return on investments and other non-financial indicators.

Accessibility: Investors treat time as value, hence net present value (NPV) is based on time. The NDC implementation for green investment must be made very accessible including access to information and finance. The private sector needs to see the accessibility and availability in NDC implementation.

11.2.2 Enabling environment

The government should use this unique opportunity of COVID-19 recovery phase and motivate its economic recovery plan to be greener through its stimulus package. It started with a good example to accelerate access to clean energy with 5 million new solar home installations and mini-grids. This should be extended to have all sectors more climate resilient such as the mass agricultural programme that is expected to bring between 20,000 and 100,000 hectares of new farmland under cultivation in every state, or the extensive public works and road construction programme, or the mass housing programme that is expected to deliver up to 300,000 homes annually. These projects should be developed in a climate smart and adapted to the climate.

A near-term action that can be undertaken to signify government's support for private sector and green investment, could be a conferment of Pioneer status by the Nigerian Investment Promotion Council (NIPC) on green investment will go a long way in boosting the attractiveness of Nigeria as a destination for green investment. Such a designation of Pioneer Status Incentives (PSI) extends incentives designed to reduce the cost of doing business in Nigeria by providing corporate income tax relief for two years to qualifying companies making investments in industries designated as "pioneer".

To aid the seamless acquisition and installation of critical inputs for green investments that advance NDC attainment, incentives such as: zero import duty tariffs; exemption from Value Added Tax for green investments; and tax concessions/holiday for re-invested profits.

Environmental taxes, if introduced, will also have the added "green" dividend of encouraging technological innovations towards a cleaner environment and efficiently regulating environmental protection efforts, especially as an effective and efficient complement to other regulatory efforts. The report therefore takes the recommendation of the Study on sustainable development through environmental taxation in Nigeria: challenges and prospects (Garba, 2017) that the Federal Inland Revenue Service should embark on massive public awareness programmes in order to educate the general public about the environmental taxation, enlightening them that the tax should be designed in such a way that will place the burden of tax on those responsible for causing a particular environmental problem, explaining that, this point is related to fairness and not to incentives and the government should design a tax that may coordinate environment and tax policies and also the tax policy may be designed to place the tax burden heavily on those responsible for the particular environmental problem, and finally, Environmental taxation will be more politically accepted, if it will contain a redistribution factor i.e. transferring wealth such as from the richer section of the economy, and the industries to the poorer section of the economy, the masses, as well as vital role in stimulating a more environmentally sustainable economy in Nigeria.

Mainstreaming Climate change adaptation into Nigeria's economic blueprints and development master plans is an important strategic action at this stage of our development because emergency preparedness guarantees effective contingency plans to protect citizens, property and the environment. Resources should be invested and concentrated on developing specific adaptation measures that are peculiar to Nigeria as a country, with a focus on the ones that correspond to the most urgent and immediate needs while aligning and leveraging numerous international initiatives and financing mechanisms aimed at assisting countries with climate change adaptation.

11.2.3 Capacity in preparing bankable green projects

Furthermore, providing project development technical assistance to aid established firms and start-ups with tools for conducting green investment business case development that capture ESG metric – triple bottom line can benefit green investment deal origination to financing close.

Expanded platforms for capacity training for preparing bankable green projects through online portals and partnerships with Business Schools and Universities should be prioritized over the current short-time workshops. This is to ensure that all dimensions of the green investment matrix are covered. For example, while the bankable project documents are necessary for securing private investment, finding financing and other support for their undertaking requires additional skills. The implementation of the Nigerian Sustainable Finance Roadmap would also be very help because it identified climate change as one of the drivers of the economy.

11.2.4 Access to finance

Innovative approach to development of vehicle for sustainable green investment such as the Nigerian Sustainable Finance Roadmap, Green Finance Delivery Instruments and Central Banks Innovative Tools for Free finance should address near-term development needs and also ensure the longer-term viability of these markets. This will illuminate the unique opportunity for public and private actors to work together to increase climate change-related private capital flows.

A stronger cross-institution initiative on climate finance and private sector in Nigeria will assist in bridging the private and public-sector perspectives by engaging development agencies, public financial intermediaries and project developers. The strategy is to use financial, and other, instruments to leverage private capital and so create innovative climate finance outcomes for Nigeria. Therefore, the process will focus on development finance institutions, public-private partnership funds and initiatives, and bi-lateral climate finance frameworks to open-up the system for effective private sector engagement in green investment in Nigeria (WRI, 2020).

11.2.5 Build partnership with other development partners

Increasing private sector collaboration with development partners requires a departure from the traditional format where private sector is engaged as contractors rather than strategic partners. Such a transition brings about new policy, programming and funding frameworks. This is an important entry point for systematically engaging the private sector in development and make their engagement strategies more demand-driven.

New adaptive roles would be created for staff and teams and will be necessary for building partnerships between the private sector and development partners. The private sector must make preparation for the adjustments such as hiring staff with experience in development-partner relations while the development agencies would also create strategic communication channels such as focal points for private sector engagement. Staff skills may also need to be built to accommodate this partnership.

11.2.6 Reduce GHG emissions

In recognition of the carbon market discussion around article 6 of the Paris Agreement, the Federal Ministry of Environment, in partnership with the Ministry of Finance, and in consultation with relevant MDAs, could formulate a carbon market position paper to be presented to the United Nations Framework Convention on Climate Change (UNFCCC) negotiations and other relevant international forums. Such a paper would discuss how the Clean Development Mechanism (CDM), and carbon markets more generally, should be reformed to enable Nigeria to maximize carbon revenues from the mitigation interventions.

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ANNEXES

Annex 1: Stakeholder engagement

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1	AfDB Nigeria Country Office	Country Director	Ebrima Faal		-
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4		Private Sector Task Manager	Mohamed SOKONA		-
5		Private Sector Task Manager			-
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7		Climate Change at DCC	Ishaku Huzi		hmshelia2@gmail.com
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9		Climate Change tool kit for SME	Linus Orakwe	Project Manager	lorakwe@ecopital.com
10		Climate Change tool kit for SME	Chidi James	Nigeria Country Expert	jameschidi2003@yahoo.com
11	Ministry of Environment	Department of Climate Change, Federal Ministry of Environment	Dr. Peter Tarfa	NDC/ UNFCCC / NDA / GEF	petertarfa@hotmail.com
12	Ministry of Environment	Department of Climate Change, Federal Ministry of Environment	Chioma Amudi	Assistant	chiomzy4lion@yahoo.com
13	Federal Ministry of Science and Technology		Dr. Peter Ekwuozor		pekweozoh@yahoo.com
16	Infobyte Power Systems Ltd.	Energy	Mr. Kayode Babatunde		abkayode@hotmail.com
17	Nigeria National Petroleum Company (NNPC) Renewable Energy Division (RED)	Energy	Mr. Bernard Agube		bbagube2@yahoo.com
18	Nigeria Incentive-based System for Agricultural Lending (NIRSAL Plc.)	Agriculture	Mr. Kayode Ashaolu		o.ashaolu@nirsal.com
19	Igbinedion University, Okada, Edo State		Mr. Spencer Nwangwu		scon333@yahoo.com
20	Nigeria Meteorological Agency (NiMet)	Climate Change	Prof. Manshi		saniamashi@gmail.com
24	Council for Renewable Energy Nigeria	Energy	Dr. Sunny Akpoyibo		astevenltd@yahoo.com
25	Sustainable Energy Practitioners Association of Nigeria (SEPAN)	Energy	Dr. Magnus Onuoha		chidimagnus1@gmail.com

26	National Designated Authority (NDA) for Transport and Climate Change	Transport	Akachukwu Okafor		akachukwu_okafor@yahoo.com
27	University of Ilorin, Ilorin, Kwara State		kayode Babatunde	-	abkayode@hotmail.com
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29	Environmental Law Research Institute	Environment	Erie Akwuebu		abakwuebu@elri-ng-org
30	Solar Force Nig. Plc	Private Sector Energy	David Umezuruike	Managing Director	info@solarforcenigeria.com
31	Nigeria Solar Capital Partners	Private Sector Energy	Joe Abrams	Managing Director	contact@nigeriasolarcapitalpartners.com
32	Leks Environmental Ltd.	Private Sector Energy	Lekan Anulgbue	Managing Director	Info@leks-re.com
33	Powertech Solar Energy Co Ltd.	Private Sector Energy	Akinola Shobanjo	Managing Director	info@solarworksng.com
34	Astrum Energy Solutions	Private Sector Energy	Engr. Izah	Manager	info@astrumenergy.com.ng
35	GIG Mobility	Private Sector Transport	Uche Ajaere	Managing Director	Contact@gigm.com
36	Setraco Nigeria Limited	Private Sector Infrastructure	Michael Hachenberg	Managing Director	info@setraco.net
37	Reynolds Construction Company	Private Sector Infrastructure	Vladimir Gorlovetsky	Project Manager	info@rccnigeria.com
38	SwanCape Ltd.	Private Sector Agriculture	Dr. Agnes Fasehun		a.fashun@swancapeltd.com
39	CIS & Coastal Poly Farms	Private Sector Agriculture	Osita Okwuashi		ositaokwuashi@gmail.com
41	AG Goldtrust Ltd.	Private Sector Irrigation	Freeman George_Amadin	Managing Director	info@aggoldtrust.com
42	Echostone Housing	Private Sector Green Building	Mr. Sammy Adigun	Managing Director	iinfo@echostonehousingnigeria.com
43	Waste Matters Nigeria Limited	Private Sector Waste Management	Ken Edike	CEO	wastematters@gmail.com
44	Omninexus Ltd	Private Sector Waste-to-Energy	Ayo Isinyemeze	CEO	isinyemeze@gmail.com
45	NESG	Private Sector	Ms. Uzoamaka Egbuche		uzoegbuche@fasmail.net
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48	Minister on Climate Change and Climate Finance		Hajia Rukayatt Muhammad	Technical Assistant	muhammadrukayyaa@yahoo.com
49	Central Bank of Nigeria	Government	Dr. Aisha Usman Mahmood	Head, Sustainability	aumahmood@cbn.gov.ng
50	NDA Office, FME	Government	Halima Bawa	DD, DCC, FME	halimabawaju@yahoo.com
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52	Dangote Industries Limited	Private Sector Transport	Nike Olaoye	Group Social Manager	nike.olaoye@dangote.com

53	Dangote Industries Limited	Private Sector Transport	Chukwudim Iwuozor	Environmental Specialist	chukwudi.iwuozor@dangote.com
54	Dangote Industries Limited	Private Sector Transport	Mmema Joshua	HSSE Officer	Mmema.Joshua@DANGOTE.COM
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56	Access Bank PLC	Finance	Ayodeji Akinrinbola	Member, Project Finance	ayodeji.akinrinbola@accessbankplc.com
57	Zenith Bank PLC	Finance	Kazeem Aremu	Research/CSR	kazeem.aremu@zenithbank.com
58	Zenith Bank PLC	Finance	Dr. Sunday Enebeli-Uzor	Head, Sustainability	Sunday.enebeli-uzor@zenithbank.com
59	Zenith Bank PLC	Finance	Olanrewaju Bakare		olanrewaju.bakare@zenithbank.com
60	United Bank for Africa	Finance	Obioma Iweka	Member, Corporate Finance	Obioma.Iweka@ubagroup.com
61	Wema Bank PLC	Finance	Babatunde Adebimpe	DFI Desk	babatunde.adebimpe@wemabank.com
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66	LAPO Microfinance Bank	Finance	Kingsley Imafidon	Credit Risk	kingsley.imafidon@lapo-nigeria.org
67	LAPO Microfinance Bank	Finance	Brandie Stevens-Igbe	Head, Sustainability	brandie.stevens-igbe@lapo-nigeria.org
68	NEXIM Bank	Finance	Mohammed Yakubu Maaji	DM	maajimy@neximbank.com.ng
69	Stanbic IBTC Bank	Finance	Chukwudi Onyejekwe	E & S Risk Mgt	chukwudi.onyejekwe@stanbicibtc.com
70	FCMB	Finance	Abidemi Onajobi	Head, Risk Management	Abidemi.Onajobi@fcmb.com
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72	FCMB	Finance	Shehu Audu	E & S Officer	Shehu.Audu@fcmb.com
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74	Africa Finance Cooperation	Finance	Omawunmi Kola-Lawal	E & S Officer	omawunmi.kola-lawal@africafc.org
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81	Development Bank of Nigeria	Finance	Oluwafemi Obadeyi		oobadeyi@devbankng.com

82	Development Bank of Nigeria	Finance	Grace Olabisi		golabisi@devbankng.com
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85	Family Homes Fund Limited	Private Sector Green Buildings	Mr. Fade Wole	Managing Director	fadewole@fhfl.com.ng
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87	Family Homes Fund Limited	Private Sector Green Buildings	Dr. Saed Kori	Head, Projects	skori@fhfl.com.ng
88	Family Homes Fund Limited	Private Sector Green Buildings	Mrs. Titi Osunbade	Lead, Projects	tosunbade@fhfl.com.ng
89					
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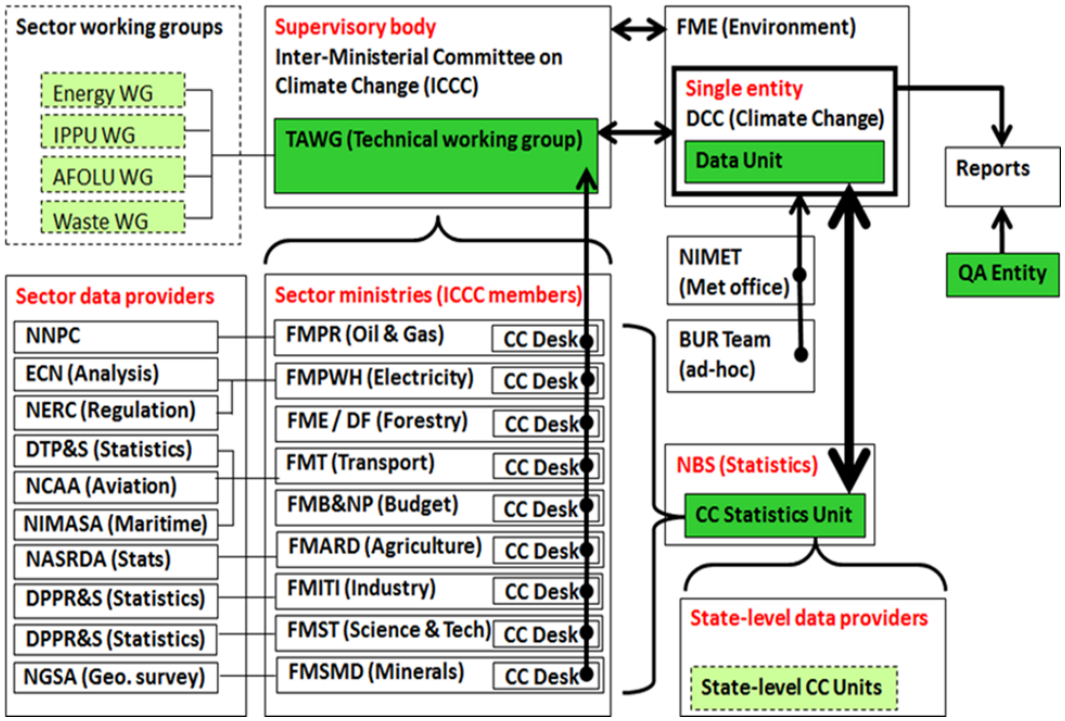
102	Auxano Solar Limited		Chukwudi Umezulora		chudieg@yahoo.co.uk
103	Jubaii Bros Engineering Limited		Rami Suleiman		rami.suleiman@jubailibros.com
104	Blue Camel Energy Limited		Suleiman Yusuf		ceo@bluecamel.us; abdullahisuyud@bluecamel.us
105	Spul Sub 1 Limited		Bukola Badmus		bbadmos@starsightlimited.com; bamoo@starsightlimited.com

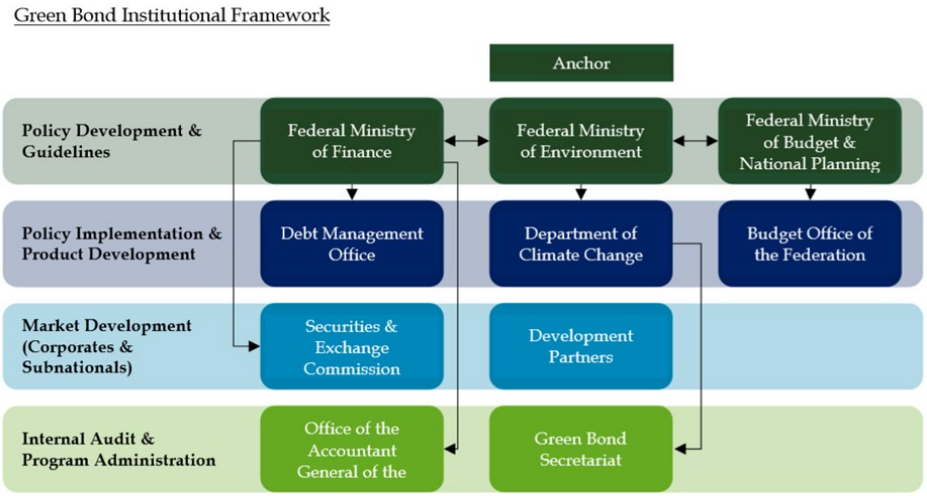
Annex 2: Tables

Table 1: Nigeria Climate Action Network



Source : Department of Climate Change 2019

Table 2: Green Bond Institutional Framework



Source: Debt Management Office, Green Bond Series II Prospectus

Table 3: Green Bond Series I

SECTOR	M/A	AMOUNT ($) MILLION	POPULATION IMPACTED	EMISSION (METRIC TONS PER YEAR)	ERR (%)	TENOR (YEARS)	JOB CREATED
Energy,							
REMU	M	0.45	6,667	14,083	1,15	7	667
EEP	M	24.46	190,473	46,427	14.08	7	5,714
Afforestation	A	5.63	3,779,400	12,969	4.44	7	3,990
Total		**30.54**	**3,976,540**	**73,479**			**10,170**

Source: Debt Management Office, Green Bond Series II Prospectus

Table 4: Green Bond Series II

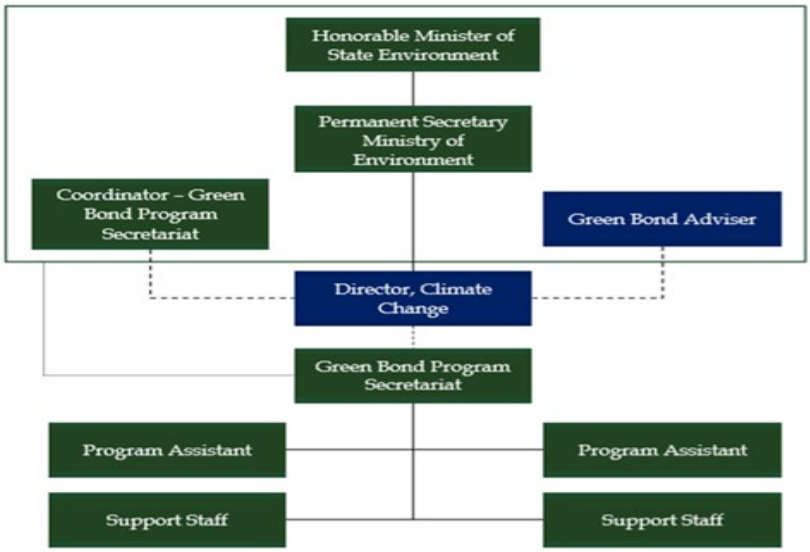
SECTOR	M/A	AMOUNT ($) MILLION	POPULATION IMPACTED	EMISSION (METRIC TONS PER YEAR)	ERR (%)	TENOR (YEARS)	JOB CREATED
Energy	M	23.69	1,750,000	39,280	0.25-7.23	5-10	1,752
Afforestation	A	3.48	408,500	4,938	1.62	10	8,579
Agriculture	A	1.71	200,000	1,680	3.77	10	4.200
Transport	M	5.92	230,000	29,978	7.03/0.64	10	12,225
Water	M/A	8.05	1,120,000	515	2.43	10	18,445
Total		**42.85**					

Source: Debt Management Office, Green Bond Series II Prospectus

Table 5: Green Bond Secretariat

Legend
1. MDAs through ICCC/MoE Identify projects with green credentials
2. MoE communicates to FMF the existence of a pool of green projects for funding
3. FMF instructs DMO to begin process of Green Bond issuance
4. DMO Communicates to OAGF to establish account that will hold resources
5. DMO issues notification to market of plans to issue a green bond
6. OAGF Communicates to CBN the new account details
7. MDAs inform MoBNP of projects that will be funded by the green bond
9. CBN funds green bond account with proceeds of issuance
8. MoBNP links Green Bond Account with projects
10. Green bond account disburses to the projects based on MDA requests

Framework of the Green Bond Secretariat



Source: Debt Management Office, Green Bond Series II Prospectus

Table 6: Green Climate Fund Programmes in Nigeria

S/N	PROJECT NAME	SECTOR	AREA OF FOCUS	ACCESS MODALITY		TOTAL VALUE ($ MIL)	TOTAL GCF ($ MIL)	TOTAL CO-FINANCE ($ MIL)	FUNDING TYPE
1	Programme for integrated development and adaptation to climate change in the Niger Basin (PIDACC/NB)	Public	Water	International / AfDB	9 countries	209.902	67.774	142.128	Grants, Senior Loans and In-kind
2	Universal Green Energy Access Programme (UGEAP)	Private	energy	International / Deutsche Bank	7 countries	301.600	80.000	221.600	Equity and Grants
3	Climate Investor One	Private	Energy	International / FMO	11 countries	821.500	100.000	751.500	Reimbursable Grants and Equity
4	Transforming Financial Systems for Climate	Private	Energy /forest	International / AFD	17 countries	738.687	271.493	467.192	Senior Loans and Grants
5	Nigeria Solar IPP Support Program	Private	Energy	Africa Finance Corporation (AFC)	Nigeria	467.000	100.000	367.000	Senior Loans and Grants
6	Acumen Resilient Agriculture Fund (ARAF)	Private	Agriculture	Acumen Fund, Inc	4 countries	56.000	26.000	30.000	Equity and Grants

Source : Green Climate Fund

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