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þþ 372 - 383

Abstract

igeria is a party to the Paris Agreement requiring her to carry out far reaching cuts in emissions of greenhouse gases (GHGs). Effectively, government intends to embark on deep cuts of emission which will seriously limit the scale of pollution recorded in the country. However, this commitment works at cross-purposes with other plans such as the Vision 20: 2020 and the Economic Recovery and Growth Plan (ERGP). In this paper the complexities inherent in implementation of the Nationally Determined Contribution (NDC) in the transition to a low carbon are examined. Data used to arrive at our findings is both qualitative and quantitative based on Nigeria Energy Calculator modeling tool for analyzing energy demand and supply in the country. We find that with business as usual scenario, GHG emissions will be high as structural crises at different scales are impediments to efficiently monitoring, reporting and verifying carbon emissions. And that market mechanism envisioned in the 2016/2017 budgets can usher in a dawn of green development yet, are incapable of holistically addressing issues of externalities in an economy where fossil dependency, biomass consumption, growing population, declining crude oil revenue, institutional debilities and inadequacy of data are rampart. The conclusion reached is Nigeria needs a new blueprint which we term the Food Sufficiency Economy (FSE) to usher in a zero carbon economy. FSE is a convergence of food sovereignty and sufficiency economy. It is in line with Africa's eco-biocommunitarianism perspective yet slanted toward Climate-Smart Agriculture as the building block for a low carbon and climate resilient future.

Keywords: Food sovereignty, sufficiency economy, low carbon, renewable energy, biomass, Climate-Smart Agriculture, NDC.

1. The INDC and Zero Transition In Nigeria

Nigeria is a party to the United Nation's Conference on Climate Change (UNFCCC) and as a party to the UNFCCC has acceded to reduce greenhouse gas emission. Fossil-led growth is the preferred pathway towards transforming the economic fortunes of the country. Nigeria's vast quantities of fossil resources are expected to catalyze growth in the process leapfrog from low middle income economy to the high middle income economy by 2020. However, the source which ensures economic growth also emits greenhouse gases (GHG). Effectively, Nigeria's journey to a green future will be undermined not only by climate events, but its consequential gas flaring (DFID, 2009). According to a study commissioned by the World Bank in 2007, the country accounts for roughly one-sixth of the world-wide gas flaring which in turn, spews some 400 million tons of carbon dioxide into the atmosphere (Paehler, 2007). The situation is further aggravated by deforestation with rural dwellers dependent on traditional biomass for domestic purposes (Bala, 2013).

The Paris Agreement entered into legal force on 4th November, 2016 when 55% of the global emitters and over 55 countries who are the major emitters ratified the accord. With the remarkable achievement of Paris, the global community's attention has shifted from submission of the INDCs to meeting the requirements of the 21st Conference of the Parties (COP21). According to government, the country's Nationally Determined Contribution (NDC) is expected to make an unconditional contribution of 20 percent below business as usual (BAU) consistent with the current development trends and government policy priorities (Intergovernmental Panel on Climate Change [IPCC], 2015). The NDC is a country specified voluntary mitigation and adaptation actions aimed at reducing greenhouse emissions to 1.5°C global average temperature threshold (Mbeva, Ochieng, Atela, Khaemba and Tonui, 2015; IPCC, 2015). Effectively, government intends to embark on deep cuts of emission with serious consequences for its fossil dependent growth pathway.

The policies and measures aimed at delivering this reduction include: improving energy efficiency, provision of electricity to rural communities currently off-grid and putting an end to gas flaring. Without ambitious mitigation action, Nigeria's per capita emission is projected to grow to 3.4 tonnes carbon dioxide equivalent (CO_2e). Given the need for development, emission from conditional contribution of 45% is expected to stabilize slightly above today's level of 2 tonnes per capita, once the full package of policies and measures has been implemented without

adaptation finance (IPCC, 2015).

Far more critical is the fact that in the Vision 20:2020 roadmap and Economic Recovery and Growth Plan (ERGP) of 2017-2020 all seek to stabilize the macroeconomic environment by aligning monetary, trade and fiscal policies, accelerate non-oil revenue generation, drastically cut cost and privatize selected assets. Nevertheless, Vision 20:2020 which is the development blueprint of the country is targeted at transforming the country by 2020 with fossil energy as engine which drives economic growth (Cervigni, Roger and Henrion, 2013). Hence, implementation of the NDC will require trade-off between economic growth and environmental sustainability.

Against this background, Nigeria's journey to a net zero carbon emission presents a dilemma that can be likened to the classic catch-22 scenario. The catch -22 playing out in Nigeria are: What are the effects of the NDC on the transition to zero carbon economy? Is Nigeria's NDC in line with the national development policy? What are the factors militating against effective implementation of the NDC in the post-Paris era? How can the country transition to a zero carbon economy without sacrificing economic growth? This paper examines the complexities surrounding Nigeria's dilemma of insisting on environmental protection while simultaneously maintaining a steady growth targeted at elevating the country to a developed economy. We also evaluate structural crisis at different scales acting as impediments towards efficiently monitoring and reporting carbon emissions.

To do justice to the issues, the paper comprises five chapters. The preceding chapter is the introduction. In the second chapter materials and methods are presented. Climate governance in Nigeria is the third chapter while constraints to the NDC implementation form the fourth section. This is closely followed with discussions of the NDC, energy status and implementation projections before arriving at our recommendations and conclusion for transitioning to a low carbon economy marks the final section.

2.0 Materials and Methods

This study relies on Nigeria Energy Calculator (NECAL2050) designed by Energy Commission of Nigeria but based on International Atomic Energy Agency (IAEA) formulated analytical modeling tools of Model for Analysis of Energy Demand (MAED) and Model for Energy Supply Strategy And General Environmental (MESSAGE) impacts, for the analysis of energy demand and supply. It is an energy planning tool developed to relate long term energy

demand and supply pathways to greenhouse gas emissions up to the year 2050. This gives quantitative insights into Nigeria's energy demand and supply enabling us analysis the effectiveness of Nigeria's NDC in charting a new pathway to an ecologically stable polity in the post-Paris era. Findings on the challenges and hopes of limiting carbon emissions to below 1.5°C temperature are presented and discussed before arriving at a synthesis for constructing an alternative roadmap to Nigerian-owned green growth and climate resilient policy.

3.0 Climate Change Governance in Nigeria

Nigeria desire is to be amongst the first 20th developed economies in the world by 2020. The country's fossil fuel industry is critical to the transition from low middle income economy to high middle income economy. Effectively, Nigeria is locked into a fossil dependent future with gas flaring contributing to global warming but recorded remarkable growth within the last decade (Okoh, 2014). The World Bank in 2013 foresaw a very bright future for Nigerian economy which was projected to grow by 6-7 % 2013 and 2014. Oil production is one of the major sources of this growth with agriculture contributing 42% of GDP (Okoh, 2017). However, the gains of macro economic growth recorded and also projected by the world Bank has been eroded by security challenges, rising unemployment, failing infrastructure, dwindling revenue from the oil and gas sector and climate extreme events. Rising incidence of climate change is a threat to government's Transformation Agenda, Vision 20:2020.

The strategic thrust of the 2017 Budget titled 'Budget of Recovery and Growth' is to ensure that the country's economic fortunes improve such that it disentangles from the recession and back on the path of growth. To bring this to fruition, capital expenditure within the 2017 budget is N2.24 trillion compared to N1.77 trillion in the 2016 Budget (Okoh, 2017). With the 24% increase over 2016 Budget government intends to carry out rapid developments in power, road and rail. The purpose of the privatization is to generate \$16.4 billion through sales of assets, improve on the infrastructure that will increase internally generated revenue. Effectively, the economy will be diversified with the diversification expected to be achieved by increasing locally produced goods that will promote export to other countries. The ERGP is articulated with the understanding that government in the 21st century ceases to be the omnibus provider of citizens' needs into a force that removes all impediments to the free flow of goods and services.

The different development instruments owe one thing is common: increasing investment in the energy sector. Thus energy plays a vital role across all sectors in the economy in reducing GHG emissions. This is in line with the Cancun Decisions of the UNFCCC which insists "addressing climate change requires a paradigm shift towards building a lowcarbon society that offers substantial opportunities and ensures continued high growth and sustainable development, based on innovative technologies and more sustainable production and consumption and lifestyles, while ensuring a just transition of the workforce that creates decent work and quality jobs" (UNFCCC, 2011, Decision 1/CP16).

Nevertheless, most of the investments in the energy sector are fossil energy related. Investment in the fossil sector targeted at bringing about economic recovery also carries with it seeds of economic degeneration, that is, if not properly managed. Within the sector government intends to use for the economic recovery lies a major outlet of ecological contagion. Herein lies the rub: building resilience of the poor to cope with increasing climate variability in a complex environment extensively reliant on crude oil for foreign exchange or strive to make the country's economic growth based on crude oil exploration to be ecologically neutral.

Although government signed Kyoto Protocol in 1994, and ratified the Kyoto Protocol in 2004 as a Non-Annex 1 signatory progress towards implementation of the Protocol within the last window (2008-2012) was slow. Nigeria as Non-Annex 1 country was not required to take any action in curtailing emission of greenhouse gases. But Nigeria was obliged to issue four key National Communications; four in depth review summaries; a progress report; a National Adaptation Programme of Action (NAPA); and a Global Climate Observing System Report '. Government met some of these commitments and took various actions to limit climate change threats such as submitting the First and Second National Communication to the parties to Kyoto Protocol; established the Climate Change Special Unit with Nigerian Meteorological Agency charged with research and climate observation and also sent three satellites to help monitor the climate. Equally, it initiated and passed the Petroleum Bill but the National Climate Change Bill is still inconclusive. In spite all these actions, it is business-as-usual as gas flaring is on the rise. With the climate bill not signed into law, there is the absence of institutional backing for addressing adaptation needs of the people.

Nigeria as a party to UNFCCC has technically acceded to Paris Agreement. The NDCs aims to

promote sustainable development while delivering on government priorities. Government's policies and measures are targeted at reducing poverty, increase social welfare as well as improving individual wellbeing, which includes a healthy environment. But by not undertaking adaptation measures Nigeria could incur significant adaptation costs from exacerbated climate change. Indeed, mitigation and adaptation to climate change is of immense importance to Nigeria in post Paris era. However, building the resilience of the poor to increasing climate variability is the most significant climate challenge facing the country. Though adaptation strategies to climate change are enshrined in Vision 20:2020, Transformation Agenda 2011 – 2015, National Adaptation Strategic Plan of Action (NASPA), the First National Communication (FNC) in 2003, Second National Communication in February 2014 and a host of other blueprints, implementation shortfall is posing serious impediment to embarking on a low carbon trajectory. To ensure an effective national response to the multifacetted impacts of climate change, Nigeria should adopt a comprehensive strategy. This will promote low-carbon while ensuring growth economic in doing so build a climate resilient society.

Constraints to Implementation of the NDC

Clean energy transition is viewed largely as a correlate of any workable framework in the attainment of human development. This underscores strong linkages between Paris Agreement and Sustainable Development Goals of 2015 that are aimed at reducing poverty, energy efficiency, environmental improvement and social equitability through green growth. In Nigeria, the implementation of NDC and economic growth is a paradox with different forces pulling at opposing ends. However, as a party to the United Nations Framework Convention on Climate Change (UNFCCC) Nigeria is committed to binding cuts with serious consequences for its carbon based economic system. Though, clean energy is not all about decarbonization and reduction in fossil consumption and production alone yet has immense co-benefits as bioenergy can create employment in rural areas, contribute to foreign exchange savings, and reduce dependence on oil as the primary source of revenue. Yet, the transition to clean energy future is a complex issue with portfolios of constraints posing serious barriers hampering building a green society. These barriers to the implementation of net zero emission includes:

Energy Poverty- A major reason for the complex energy transition is the population of the country at 170 million and of this over 92 million live without

electricity (Okoh, 2017). Nigeria is sparely populated hence building electricity grids across long distances to reach communities living on less than \$4-\$5 a day does not make economic sense. Given this, there is widespread energy poverty with most rural communities not linked to the national grid.

Fossil dependency- Devolution of clean technology and fossil fuel dependent economic system will create significant transformations in the form of employment opportunities for different sectors of the economy. Nigeria is reliant on crude oil to grow the economy. Yet, fossil fuel has perilous ramifications for economic growth. Inasmuch as the economy is extensively dependent on a single resource, factors reordering priorities toward adverse pollution will prevail. With the stiff opposition from fossil fuel industry, the deployment of renewable energy will take place at the same time with increases in fossil fuel consumption and production as evidenced in the 2016 budget.

Biomass economy- Biomass sector is critical to all decarbonization processes in most rural communities as biomass is the dominant energy source. Making the predominantly rural population transit to eco-friendly technologies will have disruptive implications for their livelihoods. In the absence of appropriate policy framework, the current deployment of biomass-based fuels will in the long run exacerbate deforestation, flood, and inadequate replacement of tree cover, soil erosion, and conversion of cropland to biofuels in addition to other agro-ecological contradictions. Finding an appropriate long-term regulatory measure and energy mix with the view to favorably exploring the country's vast biomass potential will require new energy optimization policy that emphasize energy efficiency and clean technologies while still ensuring food security.

Price of renewable- Cost is a major constraint to bridging the energy poverty gap. The country's vast biomass potential is largely untapped as a result of the difficult terrain making the implementation of clean energy technology still very expensive. Though prices of renewables are falling globally, it is still above what the country can afford. But when compared with the long-term co-benefits of renewables, such cost dwindles in significance. An example of untapped potential due to cost constraint is in hydropower. Hydropower potential alone is estimated to be 1852TWh per year, three times more than the country's current demand of 554TWh per year (Bala, 2013). Yet, about 58 per cent of the population lack access to electricity, while about 65

per cent lack access to clean energy for cooking.

Similarly, other sources of renewable energy such as wind, hydropower and solar are unexplored. Even where renewable energy is minimally generated, the technology is still very expensive.

Water and food insecurity- Finding an appropriate long-term regulatory measure and energy mix to favourably explore the country's vast clean energy potential will require new policies emphasizing efficiency in water and food production. There is severe agro-fuel complex with food security and food sovereignty imperatives encouraging land grabs. If the current land grab is allowed to persist, Food/fuel crops contradictions as bioenergy will compete for food crops as feedstock. An example is in Benue, Nassarawa and Kwara states where large swathes of land are grabbed for future plantations for sugar cane and cassava farms used as feedstock in biofuel production. These large scale land acquisition for farms are not only competing for land but are using arable land where stable food crops used for feedstock production will be pushed far beyond the reach of the poor.

Policy inconsistency- Government plays crucial role in resolving energy security impediments by redirecting policy and formulating institutional frameworks for deployment of clean energy. Political commitment and support of government gives policy direction for the development of necessary regulatory instruments for advancement of Paris climate Accord. Conducive policy instruments are vital component of clean development. Institutional bottlenecks are barriers to sustainable energy management and devolution of clean technology. Hence all stakeholders must be carried along to attain a socially inclusive green growth. But for now policy inconsistency has impaired attainment of clean energy objectives of governments. Given the policy inconsistency shortfall, there are contradictions between the NDC's high claims and the 2016 Appropriation Bill. This explains why despite acceding to the global decarbonization goal, the 2016 budget committed more resources to energy security most especially in fossil based power generation with significant amount earmarked for renewables.

Governance Deficit- Linked to the above policy inconsistency is the issue of governance deficit. Central to implementation of the NDC in the post-Paris era is governance deficit which is the outcome of policy shortfall. Pollution is mostly the outcome of externality by an economic agent on another not captured through the market. However, not all policy

shortfalls are the outcome of market failure foisted by inappropriate market mechanisms to address environmental externalities. Rather, is mostly linked to nature and perception of the state. Nigeria, as in most sub-Saharan African states, is an odd mix of different contending forces. The country is a neopatrimonial state wherein insatiable rent seeking preoccupation of the political class is the driving force for the failure to institutionalize appropriate building blocks for a low carbon climate resilience economy.

A good example of clean energy vision derailed by the neopatrimonial character of the state is in the handling of clean energy stoves. In October 2014, the FEC awarded a contract for N9.2 billion worth of cooking stoves and wonder bags for rural women under the National Clean Cooking Scheme (Okoh, 2017). In the contract, it was agreed 750,000 units of clean stoves and 18,000 units of wonder bags were to be supplied by the designer from South Africa. The scheme was expected to have a lifespan of 5 years for the provision of 20 million stoves. Environmentally speaking, this is sound reasoning as biomass extraction would have drastically dwindled. In addition, this policy has the co-benefit of not only creating jobs when assembled locally but would have environmental benefit in the form of carbon offsets thereby earning carbon credit for the country.

But with the prebendal politics of the previous administration, accumulation of both wealth and power was the order of the day. Although, the project has taken off but is straddled with all sorts of controversies. What has emerged is that graft has stalled distribution of clean stoves. In this setting, it will be misleading to attribute the failure to provide clean stoves to rural women on market imperfection rather, governance deficit is the bane and the problem. Political Support- Post-Paris framework lacks local anchorage and the much needed political support for limiting emission at the local level. Theoretically, the INDC is a bottom-up approach but in reality was crafted by technocrats and NGOs with little inputs from the society. Since the instrument crafted on decarbonization lacks local anchorage, it forebode grave danger to the environment. Not only will it impede political lock-in in the NDC but will make it difficult at individual level to integrate smallholder farmers into the national initiative.

Data Transparency- There is the dearth of accurate carbon emissions data to effectively reflect the country's carbon footprint. Capacity to accurately paint in objective terms the environmental pollution generated in all sectors is doubtful. Given this, most

of the projections in the INDC are based on estimates making it difficult to ascertain these high-level claims. The lack of publicly available and transparent data supporting government claims will undermine commitment to Paris Agreement.

Equity- The binding commitment in Paris contravenes the principle of Common But Differentiated Responsibility enshrined in Agenda 21. Although Nigeria has pledged to limit emission, conflict exists between national transformation agenda and the global decarbonization framework which has exacerbated the energy poverty gap. Structural crisis exists at different levels acting as impediment to efficient capping and monitoring of carbon emission. On one hand is the problem redistributing emission budget to address consumption and production of carbon for different individual, communities and states at different stages of growth. While at another level is the crisis of rebalancing growth towards net negative emissions in an unequal national polity with varied significance for different actors and sectors.

Discussions of the NDC, Energy Status and Implementation Projections

Nigerian economy recorded impressive growth in the last ten (10) years at the average rate of 6-7% annually . However, growth is exogenously driven and is heavily reliant on a single resource. Growth with extraneous determinant carries with it the seeds of further despoliation of nature in that global energy shocks can exacerbate pollution. With the political space highly dominated by exogenous influence which determines the nature and form of policies formulated, such policies will definitely be extroverted. An examination of the country's NDC, energy status and implementation projection alongside the development blueprints is carried out underneath with the view to ascertaining whether the journey to a low carbon economy has commenced in earnest or it is a journey to scarcity and ecological disequilibrium.

I) Climate Change Mitigation

The country fleshed out its INDCs based on the National Climate Change Policy Response Strategy (NCCPRS) which has the ambitious goal of reducing greenhouse gases by 20% unconditional and 45% conditional mitigation objectives with a target year of 2030 and implementation period of 2015 to 2030. In effect, Nigeria's GDP per capita emission which stands at 2,950 in 2014 will by 2030 increase to 3,964. According to government, the mitigation actions included in the INDC to a large extent implement or enforce existing policies or strategies. Additional

legislation and regulatory changes will be required if the country will meet its pledges. Government also promised to carry out an assessment of the changes required to the regulatory and legislative framework upon finalization of the INDC. Such pledge brings to the fore challenges bedeviled the Petroleum Bill and still trailing the Nigeria's Climate Change Bill which is overburdened by socio-economic interferences.

Given this, sketching an appropriate regulatory framework based on the INDC submission is a herculean task. Given the political horse trade from diverse groups trailing the passing of the aforementioned bills, there are bound to be implementation bottlenecks. The reinforcement of constraints is indicative of the opposing forces pulling at net zero emission. Similarly, the 2016 and 2017 Appropriation Bills are targeted at capital expenditure in infrastructural transformation but with declining revenue from crude oil, government transformation agenda faces uncertain future. This has not being helped by the ERGP which largely fossil driven. Consequently, the ability to propel society towards green growth wherein clean technology will usher in an era where temperature rises modestly is at risk. The gain of decarbonization is threatened by the reinvigoration of fossil based power production as bailout from socioeconomic shocks.

However, fossil fuel and biomass energy sources are not without their consequences for development. Global decarbonization process will proceed at different levels for different states. The implication for climate stressed region like North East and Niger Delta is that climate change will have severe impact on development thereby reordering priorities towards economic growth. This will require drastic reduction of gases spewed from oil extraction and production and biomass consumption. But there will be decreasing revenue from oil exports which is the mainstay of Nigerian economy. It will further mean reducing biomass extraction and consumption which is the primary energy source of over 70% of rural communities. Finding an appropriate energy mix to navigate the energy politics at international arena while mitigating climate change at national should be the ultimate emission stabilization goal. So, the country must make sure that such policy does not stifle the economic growth potentials. Thus, will require complementary policies formulated on abatement of the scourge and economic growth.

In the 2016 budget, government accurately assumes propelling economic growth can be achieved through improving the manufacturing base, education,

agriculture, entertainment, innovation and technology thereby reducing dependency of crude oil and associated carbon emissions. It also assumes diversification by tapping its vast natural resources will limit dependency on oil export. Though such transformation policy has the goal of efficient utilization of its vast energy resources (Table 1) but power generation and the deployment of resources toward building new power plants and transformation based on neo-extractive mentality will lead to further degradation of the ecosystem. Effectively, government has only succeeded in supplanting one form of pollution for the other.

Table 1. Possil Energ		A Resources and Nuclear Energy Sources				
S/NO	Resources	Reserves	Production (2011)	Domestic Utilization (2011)		
1	Crude Oil	37.2billion barrels	0.721billion barrels	0.097billion barrels		
2	Natural Gas	187 Tscf	3.100Tscf	83.0% -Fuel, Industries, re-injection etc. 17.0% -gas flare		
3	Coal	2.7 billion tonnes	0	Negligible		
4	Tar Sands	31 billion barrels of oil equivalent	0	0.224 million tonnes		
5	Nuclear	Yet to be quantified	0	30kW experimental nuclear reactor		

Table 1: Fossil Energy Resources and Nuclear Energy Sources

Source: Bala (2013a).

To stem such negative growth, biomass energy is critical to clean development with over 80% of the population dependent on it for domestic purposes. Nigeria's renewable energy sources are critical component of energy supply in most communities (Table 2).

Table 5: Total Primary Energy Consumption in Nigeria (2011)

Energy Form	Consumption (TOE)	%
Hydropower	592,338.50	0.71%
Fuelwood	54,539,027.42	65.50%
Petroleum Products	9,467,060.83	11.37%
Coal	4,833.79	0.01%
Natural Gas	18,663,720.08	22.41%
Total	83,266,980.62	100.00%
Source: Bala (2013).		

This must be integrated into energy policy mix. Still, traditional biomass is the primary sources of energy hence the energy sector vital for green growth is still evolving. For Natural gas still accounts for 64.97 % of the total commercial energy consumption (Table 3).

Table 3: Commercial Primary Energy Consumption in Nigeria (2011)						
Energy Form	Consumption (TOE)	%				
Hydropower	592,338.50	2.06%				
Petroleum Products	9,467,060.83	32.95%				
Coal	4,833.79	0.02%				
Natural Gas	18,663,720.08	64.97%				
Total	28,727,953.20	100.00%				
Source: Bala (2013).						

The 2016 Budget proposal seeks to stimulate the economy making it more competitive by way of focusing on infrastructural development; delivering inclusive growth; and prioritizing the welfare of the people. To meet this goal, the budget of N6.08 trillion is in line with the transformational goal but with revenue projection of N3.86 trillion will result in a deficit of N2.22 trillion. The budget while encouraging industries, commerce and investment to pick up, will in the long run trigger negative growth if not properly managed. In doing so, the immediate gains of youth unemployment and improvement in the living conditions of the extremely poor and

vulnerable class will be upturned by long-term degradations of the environment. Inasmuch as government placed high premium on fossil fuel power generation and extraction of natural capital for the economy to grow, agroecological contradictions will be heightened.

With growing agro-ecological crisis and rising population, projection under business-as-usual growth scenario, consistent with strong economic growth of 5% per year and demographic assumption (Table 4), Nigeria's emissions are expected to grow to around 900 million tonnes per year in 2030, which translates to around 3.4 tonnes per person.

Table 4:	Demographic	assumptions
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Parameter	2010	2015	2020	2025	2030	2035	2040
Population growth rate	3.16	3.52	3.80	4.00	4.00	3.88	3.74
Number of persons per household	5.2	5.60	5.60	5.40	5.20	5.00	4.00
Number of households	0.0	3.7	42.1	53.2	67.3	84.8	101.9
Source: Bala (2013).							

But this is not tenable as it will not usher the country to status of 20th most developed economy by the year 2020. The challenge facing government is that of reordering energy consumption within the country's biospheric means which is in line with higher growth rate while also ensuring energy efficiency. Increasing rate of sectoral energy demand (Table: 5) implies that to grow the economy will require higher energy consumption.

Table 5: Projected Sectoral Energy Demand in Nigeria based on 7% Growth Rate

S/ N	Sector	2009 (Base Y	(r)2010	2015	2020	2025	2030
1.	Industry (%)	13.81	28.92	37.01	40.75	44.69	48.78
2.	Transport (%)	30.80	27.62	24.56	22.92	22.27	21.62
3.	Household (%)	49.23	38.16	33.05	30.62	27.27	24.12
4.	Services (%)	6.13	5.30	5.39	5.72	5.78	5.49
Total ((mtoe)	32.14	49.92 7	6.45	112.67	158.95	224.54
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Source: Energy Commission of Nigeria (2008).

To be reckoned as one of the 20th largest economies based on a 7% growth rate will minimally increase energy consumption but cannot usher the country to the coveted status of high middle income country. Based on optimistic Growth Scenario I using NECAL2050 modeling tool, the GDP will grow by an average of 11.5% p.a. with the manufacturing sector contributing 22% to GDP by 2030 from 4% in 2010. With this, it is projected Nigeria will transit from an agrarian to an industrialized economy. For industrialization to take root, projected sectoral energy demand based on 13% growth rate is the ideal scenario (Table 6) but will spew a total of 747.27mtoe of gases per year by 2030.

Table 6: Pi	ojected Sectoral	Energy D	emand in Nige	eria base	ed on 13% (Growth Rate
S/N Secto	or 2005	2010	2015	2020	2025	2030

57	it beetor	2005	2010	2015	2020	2025	2030
		(Base	Yr)				
1	Industry (%)	13.81	27.91	40.87	51.91	62.89	71.39
2.	Transport (%)	30.80	26.78	23.24	20.86	18.55	16.51
3.	Household (%) 49.23	38.46	28.84	21.26	14.08	8.95
4.	Services (%)	6.13	6.86	7.05	5.97	4.48	3.15
	Total (mtoe)	32.14	59.45	109.97	202.74	387.52	747.27

Source: Energy Commission of Nigeria (2008).

In the implementation of this BAU scenario, Nigeria is confronted with the task of efficiently redirecting the ship of state towards sustained economic growth while keeping within the bounds of the NDC. Herein lies the hub as carbon emission holds great potential for improving the economic wellbeing of the people.

With the nexus between energy consumption and GDP growth evidenced in the 2014 GDP rebase (Okoh, 2014), carbon based growth will continue to

play vital role as burning dead carbon provides industries and households with much needed energy to fashion out the basic necessities of life. Similarly, projected electricity supply by fuel type based on 13% economic growth rate will require fossil fuel total power generation of 315,158.0 MW by 2030 (Table 7) and renewable power generation of 63,032MW (Table 8).

Table 7: Projected Electricity Supply byFuel Type Based on 13% Economic Growth Rate(MW)

	2009 (Based Yr)	2010	2015	2020	2025	2030
Coal	0.00	3352.9818	3352.9818	12,121.794	14,011.266	20,398.634
Electricity Import	0.00	0	0	0	0	67727
Gas	3803.00	13109.77	26426.06	49,996.468	120, 512.45	164,306.85
Hydro	1930.00	4157	11207	12132	12132	12132
Nuclear	0.00	0.00	3599.995	7199.99	7199.99	7199.99
Small hydro	20.00	105	319.9	759.85	1660.05	3502.1
Solar	0.00	490.35	2543.303	6417.268	15969.94	39737.5
Biomass	0	0	5	30	65	100
Wind	0.00	23	36	41	47	54
Supply	5746.00	21,238.09	47,490.24	88,698.37	171,597.69	315,158.07

Source: Bala, 2013b

 Table 8: Renewable Electricity Supply Projection in MW (13% GDP Growth Rate)

S/NO	Resource	Now	Short	Medium	Long
1	Hydro (LHP)	1938	4,000	9,000	11,250
2	Hydro (SHP)	16.18	100	760	3,500
3	Solar PV	15.0	300	4,000	30,005
4	Solar Thermal	-	300	2,136	18,127
5	Biomass	-	5	30	100
6	Wind	10.0	23	40	50
	All Renewables	2025.18	4,628	15,966	63,032
	All Energy Resources	8,700 (installed Gen Capacity)	47,490	88,698	315,158
	% of Renewables	23%	10%	18%	20%
	% RE Less LHP	0.4%	1.3%	8%	16%

Source: Bala, 2013b

By implication, fossil fuel dependency will be higher than renewables. This is premised on the fact that Nigeria's carbon emission and economic growth are not just coterminous but axiomatic necessities. Given this, the critical issue in the years to come is how to rebalance priorities towards the welfarist campaign promises of the Buhari's Administration against capping emissions obligation as required in the NDCs.

The implication for sustainable energy management is that government should from the 2016 Budget put in place measures that ensure smooth transition to an ecologically sustainable polity. Still, creating enabling environment for attainment of the decarbonization objective of Paris Agreement will stifle the socially inclusive economic growth agenda. This is against the backdrop of rising natural gas production at 3.100Tscf with high rate of 17% gas flared (Bala, 2013a). Similarly, deforestation is projected to triple by 2035 with biomass and waste still the primary energy source (Okoh, 2017).

ii) Adaptation and INDCS

Nigeria is grievously impacted by different climate risks of varied dimension. The Department For International Development (DFID) study indicates that if no adaptation action is taken, between 2-11% of Nigeria's GDP could be lost by 2020. Similarly, the Post Disaster Need Assessment (PDNA) Report following the 2012 flood also stated that the total damage caused by the disaster amounted to \$16.9billion, representing 1.4% of real GDP growth in that year. This is because agriculture is one of the sectors most sensitive to climate change. Under business as usual scenario, agricultural productivity could decline between 10 to 25 per cent by 2080. In some parts of the North, the decline in yield in rain fed agriculture could be as much as 50 percent. This in turn would impact the GDP, reducing it by as much as 4.5 percent by 2050 even though the share of agriculture in GDP will decline from 40 to just 15 percent.

Cognizant of these threats, government has taken different measures to supplement autonomous adaptation strategies of the people by complementing existing climate change mitigation efforts with diverse strategies. Projected temperature to 2050 indicates that there is increased trend leading to higher incidence of rainfall impacting on progress made towards poverty eradication and sustainable human development. Despite these efforts the impact of climate change manifest in the form of temperature increases in major cities leading to crop failures, flood, drought, soil erosion, deforestation and rising sea level. This is because agriculture is the mainstay of the economy with 80% of the population in agriculture-based industry and of this 70% depend directly on rain-fed agriculture .The rural poor constitute a substantial population of those who are reliant on the rain-fed agriculture. Most of these communities are faced with new challenges as they operate with limited resources in fragile environment sensitive to minor shifts in temperature and rainfall patterns.

Nigeria's National Adaptation Plan (NAP) is encapsulated in the NASPA document which informed the adaptation component of the INDCs. Nigeria's NDC sets out thirteen sector-specific strategies, policies, programmes and measures. NAP was established under the Cancun Adaptation Framework (CAF). The NAP blueprint presents government key opportunity to integrate the concerns and needs of the agricultural sectors and actors in broad national strategies and policies. Given this, the NDCs aim to facilitate consideration and integration of food security and agriculture concerns and perspectives into the NAP process. But also requires at the same time that elements for non-agriculture specialists to understand what the issues are and to enable agriculture stakeholders to better identify and understand the issues at stake in a mid/long term perspective and to empower them to participate efficiently in the process . Nigeria's NDC in the post Paris era is targeted at the following adaptation measures:

- Building resilience of the people in the agroecosystems to ensure their capacity to provide ecosystem services,
- Ensure the integration of the agriculture sectors as well as food security and nutrition concerns in climate change strategies and policies
- Integrated strategy related to water management, land and natural resource management, rural development and social protection

Despite the charting of an adaptation strategy to pave way for a climate resilient and low carbon growth, dwindling revenue has made realization of this goal far more complex. Consequently, the quality of life is still low, health prospects poorer, malnourishment widespread and unemployment acute. Inconsistencies in fiscal policies, lack of political will and support stymie the adaptation implementation. Whilst growing insecurity in the North Eastern region will exacerbate challenges the region is immersed. The major culprit as Buhari's Administration fittingly points out is corruption which springs from the neopatrimonial character of the state. Although remarkable improvement in GDP growth was recorded under Jonathan's Administration but the major beneficiary is a select few. For the vast majority of the people, poverty is still widespread thereby undermining the feeble gains of economic growth. For inclusive growth, the political commitment of Paris must embrace the livelihood assets of the people in manner that climate policy translates to climate action driven by the people not 'fit-all' policy handled down from the top.

Conclusion and Recommendations

The complexity of the transition to a clean energy future in the post-Paris era based on Nigeria's INDC is the central plank of this research. We have posited that government has put in place measures to stem negative emission but the collective aggregation of the diverse emissions cannot bring the country to less than 45% conditional target if the country must meet the Vision 20:2020 aspiration. Neither will the 20% unconditional mitigation achieve much as it will only

amount to bailing out few buckets of water as the Titanic ship sinks. Therefore, a zero carbon emission should be the ultimate goal in post-Paris era if the country must attain a fossil free future. This will require going beyond the current energy/security regime to a new political architecture based on adaptation and sustainability requirements as advocated in the Food Sovereignty Economy (FSE). FSE is a convergence of ecologically sound principle borrowed from food sovereignty concept and sufficiency economy but with food imperatives at heart. This approach is in line with Africa's biocommunitarianism world view where human ecological requirements are within their biophysical limits while ensuring eco-development through ecoefficiency. In short, it is a hybrid of food sovereignty and sufficiency economy wherein man-nature are harmoniously interrelated.

We therefore recommend that national development plan should be based on FSE principles wherein climate-related emission cuts are concretely addressed. There is also the need for research and data collection to be consistent, accurate, or on a scale over time that is relevant to national-level planning. Government should designate a responsible agency or institution with authority to coordinate all issues of the NDCs and as such should be an independent monitoring and evaluation unit with constitutional backing. The capacity to implement INDCs is limited, due to the lack of financial and technical resources for the attainment of the goals of Paris Agreement. So, climate finance is essential and so government must take advantage of the Climate Innovative Finance and Clean Development Mechanisms (CDMs) to combat climate change shocks. There must be synergic integration of the INDCs with national development policy which will further dovetail to NASPA linked to other national priorities such as Sustainable Development Goals, poverty reduction thereby increasing climate resiliency of the people.

Overall, Nigeria's clean energy future is taking shape with the fleshing out of the NDC. Nigeria's commitment is the baseline to monitor progress on implementation of decarbonization while opening up new business opportunities in renewables. Different communities have embraced the decarbonization and without government's leadership role. But this should not be. Government should play key role in ensuring synergetic integration of different adaptation approach into the national development policy and the standardization of the diverse devolution of clean technologies.

Though government assumes clean economy revolution has gained traction but in reality, it is on cruise control. Success in transitioning to clean energy future is not going to be measured by what government values, thinks or says but by the availability of clean energy and on how greener the economy is. Thus, success in reality is in the hands of the people and on how decarbonization policies ensure that fossil fuel extraction sustainably transforms the country to a green society.

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