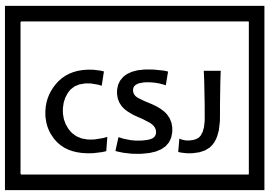
BUDGETING FOR CLIMATE CHANGE

IN WORKS



CENTRE FOR SOCIAL JUSTICE (CSJ)

(Mainstreaming Social Justice In Public Life)

First Published in 2016

By

Centre for Social Justice (CSJ)

No.17, Yaounde Street, Wuse Zone 6, P.O. Box 11418, Garki Abuja
Tel: 08055070909, 08127235995
Website: www.csj-ng.org
Email: censoj@gmail.com
Twitter: @censoj
Facebook: Centre for Social Justice, Nigeria
Blog: csj-blog.org

Centre for Social Justice (CSJ)

Table of Contents

List of Tables and Figures iv
Acronyms v
Acknowledgement vi
Executive Summary vii
1.1 Introduction 1
1.2 Role of the Federal Ministry of Works 2
2.1 Trend of Budget Allocation to Federal Ministry of Transport From 2013-2016 3
2.2 Key Challenges: From Policy, Analysis to Budgets 5
2.3 Positive Impact of Budget Allocations on Climate 6
2.4 Negative Impact of Budget Allocations on Climate Change and Programmes 8
3. Budget and Policy Recommendations 11
References 15

LIST OF TABLES

Table 1: Budgets and Funding Gap in Nigeria's Works Sector, 2013-2016

Table 2: Disaggregation between Recurrent and Capital Allocations to Works, 2013-2016

Table 3: Projects with Positive Impact on the Climate

Table 4: Projects with Negative Impact on the Climate

ACRONYMS

FGN	Federal Government of Nigeria
FMW	Federal Ministry of Works
FERMA	Federal Roads Maintenance Agency
GHG	Green House Gases
INDCs	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
MDAs	Ministries, Departments and Agencies of Government
MoWPH	Ministry of Works, Power and Housing
NASPA-CCN	National Adaptation Strategy and Plan of Action on Climate Change for Nigeria
NIIMP	Nigeria Integrated Infrastructure Master Plan
PPPs	Public Private Partnership
SDGs	Sustainable Development Goals
UNEP	United Nations Environment Programme
UNOPS	United Nations Office for Project Services
UNFCCC	United Nations Framework Convention on Climate Change

ACKNOWLEDGEMENT

Centre for Social Justice acknowledges the support of Embassy of the Federal Republic of Germany towards the research and publication of this Study. We acknowledge the research of our key facilitators and resource persons Chukwuma Smart Amaefula and Eze Onyekpere. We further appreciate the contributions of Huzi Ishaku Mshelia, Fidelis Onyejegbu and Uzochukwu Eke towards the proof reading of the Study.

EXECUTIVE SUMMARY

Climate change impacts significantly on infrastructure works. As infrastructure assets have long operational lifetimes, they are sensitive not only to the existing climate at the time of their construction, but also to climate variations over the decades of their use. For example, a substantial proportion of infrastructure built in the next five years will still be in use long after 2030 (FEHRL, 2008). To increase the resilience of both new and existing infrastructure, Nigeria must be prepared to plan ahead with an efficient budgeting system that can manage the impacts of climate change. This is an important part of the transition to a green economy.

Road construction in Nigeria is vulnerable to a myriad of climate change-induced problems and is exposed to the vagaries of changing climate conditions. Alongside the transition to a low carbon economy, increasing infrastructure's resilience to climate change impacts is a high priority for Nigeria's Government to help protect the economy and its future growth. Infrastructural development such as roads is a key sector of national development which undergoes the process of heavy engineering and use of motorized equipment that contributes to global warming. This Study has been produced to review the Federal Government's spending through the Federal Ministry of Works for a period of four years (2013-2016) and how the infrastructure policies are adapting to climate change. It is designed to catalyse action to adapt infrastructure in the climate mitigation processes. Recognising that road construction is largely public sector funded and operated, it sets out how Government can device others means in realising an infrastructure network able to adapt to the impacts of climate change.

The recommendations are as stated below.

- Provide budget funding to engage in the Nigerian climate vulnerability or risk analysis of existing roads, bridges, pavements, drainage, culverts and other infrastructure to determine the specific impact of weather events such as extreme heat and temperatures, increased rainfall and strong storms on the infrastructure. The volume of traffic on the infrastructure and its original lifespan is also taken into account in the analysis.

- Provide funding to develop guidelines and standards for the construction of new infrastructure to adapt and mitigate the vagaries of climate change. This should include processes and requisite materials to be used on the basis of scientific evidence.

- Build the capacity of regulatory and implementing agencies and stakeholders including professionals and private sector operatives on the designed guidelines and standards. Some form of extension services to guide professionals and craftsmen will be needed.
- Conduct studies to assess the economic impact of climate change on roads and other infrastructure to inform policy makers on the need for adaptation to climate change as well as the costs and benefits of various adaptation options.

- Mainstream the whole life cycle approach in the determination of the cost of infrastructure projects.

- Ensure that infrastructure is resilient to potential increases in temperature, rainfall, sea level rise, extreme weather events that are due to the changing climate.

- Ensure that investment decisions take account of changing patterns of consumer demand as a result of climate change.

- Build in flexibility in infrastructure assets so that they can be modified (especially through reinforcement, retrofitting and replacement) in the future without incurring excessive cost.

- Ensure that infrastructure organizations and professionals have the right skills and capacity to implement adaptation measures.

- The Federal Ministry of Works should establish a climate change desk and this desk should be replicated in the 36 state ministries across the country.

- The works component of the Inter-ministerial Committee on Climate Change should be well funded.

- Mandatory implementation of a detailed Environment Impact Assessment, geologic, soil and hydrological tests should be done before the implementation of major infrastructure works.

- Ensure that remedial measures to mitigate the negative impact of major projects on the environment are built into the project.

- Initiate post-construction environmental audits that ensure that the in-built mitigating measures satisfactorily address the anticipated environmental concerns.

- The introduction, in collaboration with the Standards Organisation of Nigeria (SON) and the Nigeria Society of Engineers, of stringent quality standards for various construction materials in order to guarantee the structural stability and durability of facilities.

- The Federal Ministry of Works should collaborate with the Federal Road Safety Commission and the Nigerian Police on efficient data gathering of road accidents related to weather and climate issues.

- Increased budgetary funding of climate change related research and development.

To Provide More Resources to Works

FGN should consider:

- Budgetary funding for the sector should be progressively improved starting from the 2017 federal budget.

- Toll gates should be returned to key federal roads to raise funds for the sector.

- The Federal Roads Maintenance Agency (Establishment, etc) Act should be fully implemented to the extent that the deduction and surcharge of 5% user charge on the pump price of petrol and diesel commences.

- Set up clear economic and fiduciary frameworks to ensure good returns on investment and use public pension funds to grow the sector.

- Roads bonds should be floated and tied to specific roads after good feasibility studies, proper costing and approval by the legislature.

- National Assembly should review the Infrastructure Concession and Regulatory Agency Act which regulates PPP to bring it in tandem with relevant fit and good practices suited to Nigeria's level of development.

- FGN should expedite action and move projects being considered for implementation under PPPs from the planning to the implementation stage.

There should be a specific time frame for each project being packaged under a PPP arrangement. In this regard, confidence building measures should be mainstreamed in the engagement with investors.

- PPP arrangements should be devoid of politics and government must develop the political will to stick to agreements and contracts freely signed with private sector operatives. However, at the stage of negotiations and signing, the details and facts of the transaction should be available to the public to enable contributions and possible interventions in the public interest.

- The Infrastructure Concession and Regulatory Commission and FMoWPH should be more proactive in the discharge of their duties in facilitating the packaging of roads and other infrastructure projects.

Reduce the Cost of Road Construction

This should be done as follows:

- The cost of road projects should be reduced through benchmarking with African and international prices. Taking into cognizance the cost of building roads in other countries like Ghana, which has nearly the same soil environment like Nigeria, also with the Volta Region which is swampy, will put extant costs in their proper perspective and context.

- It is imperative that the Bureau of Public Procurement devises a standard database of prices of road construction materials and road construction across different soil textures in Nigeria to guide procurement in the sector.

- Augmentation and contract variations should be done within the context of prevailing macroeconomic fundamentals such as inflation and the value of the national currency. The National Assembly should demand and review relevant documentation before approving any upward review. The review should not be left to the executive alone.

Halt Perennial Road and Infrastructure Projects and Spreading Resources Too Thin

This should be achieved as follows:

- FGN should consider a moratorium on new projects in the road sector pending the completion of ongoing projects except new funding sources are raised.

- Among the ongoing ones, there should be prioritization to guarantee the completion of more vital national roads on schedule.

- Ongoing road projects could also be packaged for PPPs and other private sector funding arrangements. The sector needs a good dose of discipline and careful planning.

1.1 INTRODUCTION

Climate change and infrastructure both impact negatively on each other. Climate change affects the durability of infrastructural projects and at the same time, provisions for infrastructural projects are the largest contributors to climate change. The construction of roads, airports, bridges, railways etc. are necessary infrastructural projects that can never be ignored in any country. While some nations have reached an advanced stage of development in providing for these facilities, other nations are still constructing many of these infrastructure and also setting up plans to build more of it in several developmental phases. The impacts of climate change on infrastructural works are immense. In so many cities, the rise of sea level has led to costal floods which affect infrastructural facilities. It has also led to loss of available land areas, due to constant erosions and flooding. According to Nigeria's Intended Nationally Determined Contribution (INDC 2015), the 2012 flood ravaged about 17 states and destroyed physical and durable assets estimated to be US$16.5 billion) or about 1.4% of the real Gross Domestic Product (GDP) growth in that year.

Despite the fact that building infrastructure contributes largely to green house gases (GHG), it cannot be left out in development; it is one of the resources needed for economic prosperity in a nation. The target of every government is to provide adequate infrastructural projects to boost its economy. The provision of transport bridges, roads, highways and railways are very important aspects of infrastructural projects that cut across the agenda of every government. The United Nations Environment Programme (UNEP) Report (2009) estimated that at present, buildings contribute as much as one third of total global greenhouse gas emissions, primarily through the use of fossil fuels during their operational phase[1]. The building sector contributes up to 30% of global annual GHG emissions and consumes up to 40% of all energy (UNOPS 2012)[2]. It also reports that given the massive growth in new construction in economies in transition, and the inefficiencies of existing building stock worldwide, if nothing is done, GHG emissions from buildings will more than double in the next 20 years. The Intergovernmental Panel on Climate Change (IPCC) has reported that the impacts of climate change are accelerating and that they are largely driven by human caused GHG emissions. According to the IPCC, the global temperature has to be kept under 2 degrees Celsius above pre-industrial level.

The need to further protect the environment while embarking on infrastructural projects is reinforced by the principle of Inter-generational Equity which requires that the needs of the present generation are met without compromising the ability of future generations

[1] http://www.unep.org/sbci/pdfs/SBCI-BCCSummary.pdf

[2] United Nations Office for project Services (UNOPS): Policy for Sustainable Infrastructure available at https://www.unops.org/SiteCollectionDocuments/Multimedia/Rio/unops_policy_for_sustainable_infrastructure.pdf

to meet their own needs and Intra-generational Equity which requires that different groups of people within the country and within the present generation have the right to benefit equally from the exploitation of resources and that they have equal rights to a clean and healthy environment[3]. UNOPS (2012) further affirmed the words of the Declaration on the Right to Development to the effect that:

> "*The right to development is an inalienable human right by virtue of which every human person and all peoples are entitled to participate in, contribute to, and enjoy economic, social, cultural and political development, in which all human rights and fundamental freedoms can be fully realized*"[4].

UNOPS (2012) further provides that:

> "*For the UN, health care, education, housing and the fair administration of justice are not commodities for sale to the few, but rather rights to which all are entitled without discrimination. And anything we do in the name of development should be designed to advance these rights, and at the very least, should do nothing to undermine their realization*."[5]

The foregoing implies that the safety and sustainability of the environment must be put into consideration while harnessing the resources of the environment for infrastructure. Hence to protect human beings and their rights, adaptation and mitigation of climatic effects on the environment has to be considered while embarking on infrastructural projects. According to the Climate Economy Report 2015, integrating climate change objectives into infrastructure decisions will increase resilience to climate change impacts, avoid locking in carbon-intensive and polluting investments and bring multiple additional benefits, such as cleaner air and lower traffic congestion.[6] For example, mitigation steps in buildings can be achieved through better building energy codes that improve energy efficiency, promote energy security and require the use of renewable energy.

1.2 ROLE OF THE FEDERAL MINISTRY OF WORKS

The Federal Ministry of Works is charged with several statutory responsibilities among which are[7]:

- Federal Highway; Construction and Rehabilitation

[3] See Guiding Principles of the Nigerian Policy on the Environment.
[4] Article 1 (1) of the Declaration on the Right to Development adopted by United Nations General Assembly resolution 41/128 of 4 December 1986.
[5] https://www.unops.org/SiteCollectionDocuments/Multimedia/Rio/unops_policy_for_sustainable_infrastructure.pdf
[6] http://2015.newclimateeconomy.report/wp-content/uploads/2015/10/Ensuring-infrastructure-is-climate-smart.pdf
[7] See www. works.gov.ng or http://pwh.gov.ng/index?what=19&title=Our%20Mandate

- Federal Highway; Planning and Design
- Monitoring and maintenance of federal roads and building bridges nationwide
- Provision of engineering infrastructure and
- Surveying and mapping the nation's internal and international boundaries

These mandates are high engineering activities that require combustion of fossil fuel to operate engineering equipment. Beyond the Federal Government, states and local governments are also involved in road construction and other works and as such, collaboration between the three tiers of government is imperative in the climate change mitigation effort.

How have budgetary allocations to works been exacerbating climate change or contributing to climate change mitigation? This Study aims to analyze the budget of Federal Ministry of Works for a period of four years (2013-2016) and evaluate how the allocations key into climate change mitigation strategies in line with the National Policy on Environment, National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (NASPA-CCN) and the Intended Nationally Determined Contributions (INDCs)**.** According to the INDC, the criteria against which potential mitigation actions were assessed focused on cost effectiveness, mitigation potential, poverty alleviation and job creation, feasibility of implementation and short term results. Others are gender and inclusion, health and air quality, land degradation and water quality including deforestation.

2.1 TREND OF BUDGET ALLOCATION TO FEDERAL MINISTRY OF TRANSPORT FROM 2013-2016

A review of the trend of allocations to the sector over the four year period 2013 to 2016 follows below.

Nigeria is committed to providing not less than $5.2 billion of its resources to roads construction under the Nigeria Integrated Infrastructure Master Plan (NIIMP) benchmark. However, some part of the resources is expected to come from public private partnerships, borrowing and pension fund investments. But the budget is expected to provide a reasonable part of the funds. In Table 1 below, the Study reviews the allocations to Works 2013 to 2016 and their compliance with the NIIMP commitment. The decision to go back to 2013 is to establish a trend in the allocations which will be compared to the 2016 allocation. Table 1 also seeks to establish the funding gap.

Table 1: Budgets and Funding Gap in Nigeria's Works Sector, 2013-2016

Year	Overall Federal Budget (₦ Millions)	Total Allocation to Works (₦ Millions)	% of Vote to Works to Overall Vote	NIIMP Projection for Works (₦ Millions); Equivalent of USD5.2 billion	Variance between NIMP Projection and Allocation to Works
2013	4,987,220,425.601	191,251,326,508	3.83	831,480,000,000	640,228,673,492
2014	4,695,190,000,000	133,726,558,986	2.85	954,200,000,000	820,473,441,014
2015	4,493,363,957,158	44,985,916,543	1.00	1,035,320,000,000	990,334,083,457
2016	6,060,677,358,227	293,173,916,543	4.84	1,638,000,000,000	1,344,826,083,457

Source: Budget Office of the Federation: Approved Budgets and NIIMP[8]

Table 1 shows that the Federal Government of Nigeria (FGN) allocated 3.83%, 2.85%, 1.00% and 4.84% of its overall budget to the works sector in the years 2013, 2014, 2015 and 2016 respectively. This is an average allocation of 3.02% of the overall budget over the four year timeframe. The variance between the appropriation and the NIIMP projection for the four years cumulatively amounts to N3.795 trillion whilst it came up to an average of N948.97 billion a year. In 2013, the vote was only 23% of the NIIMP project; it was 13.80% in 2014; 4.35% in 2015 and 17.90% in 2016 respectively. Overall, this is an average allocation of 14.76% of the NIIMP projected sum over the four years. Essentially this shows that without other resources coming in from the private sector under PPPs or any other source, the funding gap remains very large. However, NIIMP did not take climate change into consideration in articulating its financial projections. Therefore, the funding gap is bound to widen when climate change mitigation and adaptation considerations are factored into the equation. It is a fact that the initial cost of financing works projects which take into consideration the need for climate mitigation will likely be more expensive than business as usual constructions. However, over the project's life cycle, the climate friendly works will be cheaper in the long run. But there is no costed Nigerian framework showing the cost of infrastructure and works projects factoring in climate change mitigation and adaptation strategies.

Table 2 shows the distribution of allocations between capital and recurrent expenditure over the four year term of the review. The MoWPH got an allocation of N456, 936, 811,203 in the 2016 federal budget. However, the presiding Minister, Babatunde Fashola declared that from the N422.964 billion given to the sector for capital projects, N268 billion which represents 62 percent will be allocated to works[9]. The Minister disclosed that the FGN is ready to finish the construction of 200 uncompleted roads rather than starting new ones.

[8] The conversion from USD to the naira was taken from Fx-rate.net/NGN/?date_input using the prevailing CBN rate on the last day of the year.
[9] Vanguard Newspaper of February 16, 2016.

Table 2: Disaggregation between Recurrent and Capital Allocations to Works, 2013-2016

Year	Total Allocation to Works (₦ Million)	Recurrent Expenditure (₦ Million)	% of Recurrent Expenditure to Total works Allocation (₦ Million)	Capital Expenditure (₦ Million)	% of Capital Expenditure to Total Works (₦ Million)
2013	191,251,326,508	26,590,178,318	13.90	164,661,148,188	86.10
2014	133,726,558,986	27,405,355,931	20.49	106,321,203,055	79.51
2015	44,985,916,543	25,173,916,543	55.96	19,812,000,000	44.04
2016	293,173,916,543	25,173,916,543[10]	8.59	268,000,000,000	91.41

Source: Approved Budgets 2013 - 2016, BOF.

There is a marked reduction in the recurrent expenditure for 2016. Whether this can be accounted for by the merger of the former Works Ministry with Power and Housing is not clear. The average recurrent expenditure over the four years is 24.74% of the vote of the sector whilst capital expenditure got 75.26% over the four years. This is a good development but capital expenditure needs more emphasis in the future, especially as the non-budgetary sources of funding are yet to be developed. The projection is to increase public funding while developing the non-budgetary sources.

2.2 KEY CHALLENGES: FROM POLICY, ANALYSIS TO BUDGETS

It is imperative to state that unlike in developed countries, there is no Nigerian climate vulnerability or risk analysis of existing roads, bridges, pavements, drainage, culverts, etc; to determine the specific impact of weather events such as extreme heat and temperatures, increased rainfall and strong storms on these infrastructure[11]. The volume of traffic on the infrastructure and its original lifespan is also taken into account in this kind of analysis. The foregoing is very important for mitigation and adaptation and increased resilience which would lead to prioritization for reinforcement, replacement and retrofitting. It is however generally assumed that extreme heat will lead to road cracking and more maintenance costs for asphalt roads. Again, there are no defined Nigerian guidelines and standards for the construction of new roads, bridges, etc. to become climate change resistant and to adapt to its vagaries[12]. Even when the standards and guidelines have been developed, the capacity of the regulatory and implementing agencies and stakeholders, like private sector operatives and professionals will need to be developed. Also, to determine whether a particular project is compliant to the demands of the changing climate will depend on its design, construction materials and the prior empirical analysis that was invested into its design

[10] This is based on the recurrent expenditure of the stand alone Ministry of Works in 2015.
[11] See Adaptation of Road Infrastructure to Climate Change; Dipl.-Phys. Carina Herrmann, Federal Highway Research Institute (BASt),herrmann@bast.de
[12] Adaptation of Road Infrastructure to Climate Change, supra.

and construction. Thus, a good deal of the work may need to be done (when guidelines and standards have been developed) at the pre and post appropriation stages to determine whether standards and guidelines have been complied with.

Currently, there is no work in Nigeria that attempts to economically assess the impact of climate change on road infrastructure to inform policy makers on the need to adapt to new ways of construction and maintenance of roads and infrastructure, as well as assess the costs and benefits of various adaptation options[13]. Definitely, the upfront costs of infrastructure that is climate change compliant will be more compared to such infrastructure in a business as usual approach. However, the bottom line is that when the life cycle approach is adopted, the cost of infrastructure that takes cognizance of climate change will be cheaper over the life cycle[14].

It is also imperative that specific studies be done to assess heat retaining qualities of asphalt under the different Nigerian climatic conditions. This will facilitate an understanding of the GHG emitting qualities of asphalt and concrete or roads constructed with alternative materials.

2.3 POSITIVE IMPACT OF BUDGET ALLOCATIONS ON CLIMATE

The Study will now review some of the allocations to the sector based on the INDC criteria of cost effectiveness, mitigation potential, poverty alleviation and job creation, feasibility of implementation, short term results, gender and inclusion, health and air quality, land degradation and water quality including deforestation.

Table 3: Projects with Positive Impact on the Climate

Year	Project	Allocation (₦)
2016	CONSTRUCTION/PROVISION OF EROSION CONTROL & DRAIN	130,679,867
	SUSTAINABLE DEVELOPMENT GOALS PROJECTS I	4,000,000,000
	SUSTAINABLE DEVELOPMENT GOALS PROJECTS II	5,000,000,000
	URBAN RENEWAL AND EROSION CONTROL PROGRAMME IN SELECTED LOCATIONS OF CROSS RIVER CENTRAL SENATORIAL DISTRICT	354,000,000
	EROSION CONTROL WORKS AT EGBELU NGURU-UMUOYE ROAD, NGOR OKPALA, IMO STATE	100,000,000
	CONSTRUCTION OF ROAD AND DRAINAGES AT BAAKI/OWODE	150,000,000
	CONSTRUCTION OF ROAD AND DRAINAGES AT IDIOPELE-	81,000,000

[13] (2015), The Economic Impact of Climate Change on Road Infrastructure in Ghana; by Daniel Kwabena Twerefou , Paul Chinowsky, Kwame Adjei-Mantey and Niko Lazar Strzepek

[14] (2015), The Economic Impact of Climate Change on Road Infrastructure in Ghana, supra.

	ALAYIN-IREGBA	
	EROSION CONTROL WORKS AT EGBELU NGURU-UMUOYE ROAD, NGOR OKPALA, IMO STATE	100,000,000
	EROSION CONTROL WORKS AT EKEISU-NKWOALA UMUOYE ENYIOGUGU ROAD, ABOH MBAISE/NGOR OKPALA FEDERAL CONSTITUENCY, IMO STATE	100,000,000
	EROSION CONTROL WORKS AT IHITTE JUNCTION TO AFOR UMUAHIAGU MARKET ROAD, IMO STATE	50,000,000
	EROSION CONTROL WORKS AT IHITTE JUNCTION TO AFOR UMUAHIAGU MARKET ROAD, IMO STATE	50,000,000
	PROVISION OF DRAINAGES TO KOFAR GARIN YAMMA IN RUMFA HADEJA LGA	20,000,000
	CONSTRUCTION OF INFRASTRUCTURE, ROADS, DRAINAGES AND ASPHALT FINISHING	1,094,566,647
	MAPPING OF NATIONAL GEO-SPATIAL DATA FOR DEVELOPMENT AND GOOD GOVERNANCE	19,044,184
	EROSION AND FLOOD CONTROL OF 1.5KM ROAD AT OKWARAIBEKWE-OKOROBI UMUJU COMMUNITIES IN IDEATO SOUTH LGA, IMO STATE	20,282,452
	RESEARCH AND DEVELOPMENT	253,453,460
2015	COMPLETION ROADS, BRIDGES, OF REHABILITATION WATER DRAINS OF AND INFRASTRUCTURAL ELECTRICITY) FACILITIES (INTERNAL)	50,000,000
2014	PROVISION OF SOLAR STREET LIGHT AT THE PREMISES OF THE ELECT./MECH. ENGINEERING TRAINING SCHOOL, KUJE.	5,000,000
	EMERGENCY REINSTATEMENT OF GULLY EROSION AT KM 127+000 ALONG BENIN-OKENE ROAD ROUTE 50(A2) AND KM 14+000 ALONG AUCHI AGENEBODE ROAD IN EDO STATE C/No.6120	148,000,000
	RESEARCH AND DEVELOPMENT	131,000,000
2013	RESEARCH AND DEVELOPMENT	171,600,000
	CONSTRUCTION AND REPAIRS OF CULVERTS, DRAINAGES, BRIDGES, ETC IN KANO CENTRAL SENATORIAL DISTRICT	68,000,000

Source: Budget Office of the Federation (2013-2016)

It is imperative to state that erosion and flood control projects and solar street lights are not only limited to the extant Ministry. Other MDAs including Environment have similar projects. Erosion control is needed to save the soil, lives and property from adverse climatic effects and prevent land degradation. Drainages are also relevant to control the

flow of water and prevent harm to human and animal lives and property. Roads and drainages facilitate mobility and provide the opportunity for rural dwellers including farmers to move their goods and services to earn a livelihood thereby creating jobs and alleviating poverty. Solar projects supply energy without harming the climate system. Reports from the implementation of solar projects in the works and other ministries show that most of the installations are not of good quality and only work for a few months before they pack up. The issue of quality, standards, specifications and consumer protection should therefore attract the attention of the authorities whilst MDAs should specifically include the expected lifespan of solar equipment and consumables in the contracts with works and service providers.

Also, simply providing a lump sum of money for SDGs without proper disaggregation of what the allocation is for is not a best practice worthy of replication. Again, research and development that is not clarified is a hazy provision that demands further unpacking so that its specifics can be clear. Also, the term mapping of geo-spatial data for development and good governance is vague and needs to be made more specific. However, data gathering, analysis and using same for planning and budgeting is a step in the right direction because it provides the basis for meaningful engagement of climatic challenges.

The key challenge in the type of projects listed above is that they are usually repeated in the federal budget year after year tending to suggest that either funds were not fully released or the implementation could not be completed in one, two or three years. So many of them are listed in the budget, leading to resources being spread too thinly, and sometimes their supervision exceeds the capacity of the supervising ministry. This challenge leads to the failure to achieve the desired goals. The gender dimension seems to be missing in most of these projects as they are assumed to be gender neutral. It is imperative that projects mitigating climate change are contextualized to determine their impact on the different segments of the human population. Finally, bush clearing during road construction also leads to deforestation. The example of the Cross River State highway (though not a federal road) that will be cut in the thick of the tropical forest is an example of a road construction that negatively affects the climate and livelihood resources of the poor. Thus, projects must be weighed on a cost benefit analysis scenario to arrive at whether their climate benefits outweigh their costs.

2.4 NEGATIVE IMPACT OF BUDGET ALLOCATIONS ON CLIMATE CHANGE AND PROGRAMMES

Table 4 lists some projects in the Ministry that are deemed to have negative impact on the climate.

Table 4: Projects with Negative Impact on the Climate

Year	Project	Allocation (₦)
2016	MAINTENANCE OF PLANTS/GENERATORS	14,670,580
	PLANT / GENERATOR FUEL COST	40,916,796
	CONSTRUCTION OF COMPLETE MOTORIZED WATER BOREHOLE SYSTEM WITH LARGE CAPACITY TANK AT FAGUNWA STREET, IJAPO HOUSING ESTATE, AKURE, ONDO STATE	20,000,000
	MOTORIZED BOREHOLE AT OBAGANYA, OTUKPO, BENUE STATE	10,000,000
	MOTORIZED BOREHOLE AT SHENDAM/MIKANG/QUA'AN-PAN, PLATEAU STATE	20,000,000
	COAL TO POWER GENERATION DEVELOPMENT IN NIGERIA IN ENUGU AND GOMBE/BENUE/KOGI	72,000,000
	MAINTENANCE OF PLANTS/GENERATORS	85,246
	PLANT / GENERATOR FUEL COST	1,278,689
	MAINTENANCE OF PLANTS/GENERATOR	2,099,925
	PLANT / GENERATOR FUEL COST	6,999,750
	MAINTENANCE OF PLANTS/GENERATORS	5,883,949
	PLANT / GENERATOR FUEL COST	4,220,910
2015	PLANT / GENERATOR FUEL COST	17,042,943
	MAINTENANCE OF PLANTS/GENERATORS	1,270,443
	PLANT / GENERATOR FUEL COST	11,857,466
	FEDERAL ROAD MAINTENANCE AGENCY	
	MAINTENANCE OF PLANTS/GENERATORS	846,962
	PLANT / GENERATOR FUEL COST	4,404,202
	COUNCIL FOR THE REGULATION OF ENGINEERING IN NIGERIA (COREN)	
	MAINTENANCE OF PLANTS/GENERATORS	423,481
	PLANT / GENERATOR FUEL COST	254,089
	PLANT / GENERATOR FUEL COST	2,371,493
2014	MAINTENANCE OF PLANTS/GENERATORS	6,613,650

	PLANT / GENERATOR FUEL COST	25,051,402
	MAINTENANCE OF PLANTS/GENERATORS	2,000,000
	PLANT / GENERATOR FUEL COST	20,000,000
	FEDERAL ROAD MAINTENANCE AGENCY	
	MAINTENANCE OF PLANTS/GENERATORS	10,000,000
	PLANT / GENERATOR FUEL COST	1,200,000
	COUNCIL FOR THE REGULATION OF ENGINEERING IN NIGERIA (COREN)	
	MAINTENANCE OF PLANTS/GENERATORS	137,663
	SURVEY COUNCIL OF NIGERIA	1,456,622
2013	PLANT / GENERATOR FUEL COST	22,615,630
	INTERNATIONAL TRAINING	9,585,706
	PURCHASE OF POWER GENERATING SET	17,000,000
	COUNCIL FOR THE REGULATION OF ENGINEERING IN NIGERIA (COREN)	
	MAINTENANCE OF PLANTS/GENERATORS	385,726
	FEDERAL ROAD MAINTENANCE AGENCY	
	INTERNATIONAL TRAVEL & TRANSPORT: TRAINING	15,000,000
	INTERNATIONAL TRAVEL & TRANSPORT: OTHERS	8,000,000
	MAINTENANCE OF PLANTS/GENERATORS	2,000,000
	PLANT / GENERATOR FUEL COST	15,000,000
	FEDERAL SCHOOL OF SURVEY, OYO	
	MAINTENANCE OF PLANTS/GENERATORS	5,000,000
	PLANT / GENERATOR FUEL COST	8,361,283
	OFFICE OF THE SURVEYOR-GENERAL OF THE FEDERATION	
	INTERNATIONAL TRAVEL & TRANSPORT: OTHERS	12,700,000
	MAINTENANCE OF PLANTS/GENERATOR	2,000,000

	PLANT / GENERATOR FUEL COST	12,000,000
	SURVEY COUNCIL OF NIGERIA	
	PLANT / GENERATOR FUEL COST	675,000

Source: Budget Office of the Federation (2013-2016)

From Table 4 above, fossil fired generators and their maintenance contribute to global warming and are not cost effective over the whole lifecycle compared to renewable energy investments. It is expected that federal MDAs such as the one in charge of Works should lead the campaign for using renewable energy to power their office complexes. Funding for coal power generation misses the point of sustainability to the extent that it leads to health, land, air and water quality degradation and deforestation. It is an attempt to lock in an energy generation investments for a period of not less than 30 years at a time other countries have stopped or have set targets to stop the use of coal fired electricity generation. Again, boreholes instead of being motorized and powered by fossil fuels could be powered by solar and other renewables. International travels may be necessary for the bureaucracy and policy work. However, it should be minimized due to the large carbon foot prints of air travel. It is expected that most of the trainings should be localized and avoid unnecessary international travels and as such contribute to cost effectiveness and reduction of the cost of governance.

3. BUDGET AND POLICY RECOMMENDATIONS

- Provide budget funding to engage in the Nigerian climate vulnerability or risk analysis of existing roads, bridges, pavements, drainage, culverts and other infrastructure to determine the specific impact of weather events such as extreme heat and temperatures, increased rainfall and strong storms on the infrastructure. The volume of traffic on the infrastructure and its original lifespan is also taken into account in the analysis.

- Provide funding to develop guidelines and standards for the construction of new infrastructure to adapt and mitigate the vagaries of climate change. This should include processes and requisite materials to be used on the basis of scientific evidence.

- Build the capacity of regulatory and implementing agencies and stakeholders including professionals and private sector operatives on the designed guidelines and standards. Some form of extension services to guide professionals and craftsmen will be needed.

- Conduct studies to assess the economic impact of climate change on roads and other infrastructure to inform policy makers on the need for adaptation to climate change as well as the costs and benefits of various adaptation options.

- Mainstream the whole life cycle approach in the determination of the cost of infrastructure projects.

- Ensure that infrastructure is resilient to potential increases in temperature, rainfall, sea level rise, extreme weather events that are due to the changing climate.

- Ensure that investment decisions take account of changing patterns of consumer demand as a result of climate change.

- Build in flexibility in infrastructure assets so that they can be modified (especially through reinforcement, retrofitting and replacement) in the future without incurring excessive cost.

- Ensure that infrastructure organizations and professionals have the right skills and capacity to implement adaptation measures.

- The Federal Ministry of Works should establish a climate change desk and this desk should be replicated in the 36 state ministries across the country.

- The works component of the Inter-ministerial Committee on Climate Change should be well funded.

- Mandatory implementation of a detailed Environment Impact Assessment, geologic, soil and hydrological tests should be done before the implementation of major infrastructure works.

- Ensure that remedial measures to mitigate the negative impact of major projects on the environment are built into the project.

- Initiate post-construction environmental audits that ensure that the in-built mitigating measures satisfactorily address the anticipated environmental concerns.

- The introduction, in collaboration with the Standards Organisation of Nigeria (SON) and the Nigeria Society of Engineers, of stringent quality standards for

various construction materials in order to guarantee the structural stability and durability of facilities.

- The Federal Ministry of Works should collaborate with the Federal Road Safety Commission and the Nigerian Police on efficient data gathering of road accidents related to weather and climate issues.

- Increased budgetary funding of climate change related research and development.

To Provide More Resources to Works

FGN should consider:

- Budgetary funding for the sector should be progressively improved starting from the 2017 federal budget.

- Toll gates should be returned to key federal roads to raise funds for the sector.

- The Federal Roads Maintenance Agency (Establishment, etc) Act should be fully implemented to the extent that the deduction and surcharge of 5% user charge on the pump price of petrol and diesel commences.

- Set up clear economic and fiduciary frameworks to ensure good returns on investment and use public pension funds to grow the sector.

- Roads bonds should be floated and tied to specific roads after good feasibility studies, proper costing and approval by the legislature.

- National Assembly should review the Infrastructure Concession and Regulatory Agency Act which regulates PPP to bring it in tandem with relevant fit and good practices suited to Nigeria's level of development.

- FGN should expedite action and move projects being considered for implementation under PPPs from the planning to the implementation stage. There should be a specific time frame for each project being packaged under a PPP arrangement. In this regard, confidence building measures should be mainstreamed in the engagement with investors.

- PPP arrangements should be devoid of politics and government must develop the political will to stick to agreements and contracts freely signed with private

sector operatives. However, at the stage of negotiations and signing, the details and facts of the transaction should be available to the public to enable contributions and possible interventions in the public interest.

- The Infrastructure Concession and Regulatory Commission and FMoWPH should be more proactive in the discharge of their duties in facilitating the packaging of roads and other infrastructure projects.

Reduce the Cost of Road Construction

This should be done as follows:

- The cost of road projects should be reduced through benchmarking with African and international prices. Taking into cognizance the cost of building roads in other countries like Ghana, which has nearly the same soil environment like Nigeria, also with the Volta Region which is swampy, will put extant costs in their proper perspective and context.

- It is imperative that the Bureau of Public Procurement devises a standard database of prices of road construction materials and road construction across different soil textures in Nigeria to guide procurement in the sector.

- Augmentation and contract variations should be done within the context of prevailing macroeconomic fundamentals such as inflation and the value of the national currency. The National Assembly should demand and review relevant documentation before approving any upward review. The review should not be left to the executive alone.

Halt Perennial Road and Infrastructure Projects and Spreading Resources Too Thin

This should be achieved as follows:

- FGN should consider a moratorium on new projects in the road sector pending the completion of ongoing projects except new funding sources are raised.

- Among the ongoing ones, there should be prioritization to guarantee the completion of more vital national roads on schedule.

- Ongoing road projects could also be packaged for PPPs and other private sector funding arrangements. The sector needs a good dose of discipline and careful planning.

REFERENCES

Carina Herrmann. *Adaptation of Road Infrastructure to Climate Change.* Federal Highway Research Institute (BASt). Available at http://www.ectri.org/YRS13/Documents/Papers/Session5b_6a/YRS13_Session5b-6a_Herrmann_BASt-Paper.pdf

Forum of European National Highway Research Laboratories (2008). 'New Road Construction Concepts: Towards reliable, green safe and smart and human infrastructure in Europe', FEHRL, Belgium.

National Adaptation Strategy and Plan of Action on Climate Change for Nigeria (2011).

Nigeria's Intended Nationally Determined Contributions (INDCs) submitted by the Federal Government of Nigeria (FGN) to the United Nations Framework Convention on Climate Change (UNFCCC) in 2015.

Rydge, J., Jacobs, M. and Granoff, I., 2015. Ensuring New Infrastructure is Climate-Smart. Contributing paper for Seizing the Global Opportunity: Partnerships for Better Growth and a Better Climate. New Climate Economy, London and Washington, DC. Available at: http://2015.newclimateeconomy.report/wp-content/uploads/2015/10/Ensuring infrastructure-is-climate-smart.pdf

Seto K.C., S. Dhakal, A. Bigio, H. Blanco, G.C. Delgado, D. Dewar, L. Huang, A. Inaba, A. Kansal, S. Lwasa, J.E. McMahon, D.B. Müller, J. Murakami, H. Nagendra, and A. Ramaswami, 2014: Human Settlements, Infrastructure and Spatial Planning. In: Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.)]. Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA. Available at: https://www.ipcc.ch/pdf/assessment-report/ar5/wg3/ipcc_wg3_ar5_chapter12.pdf

Twerefou D. K.; Chinowsky P.; Adjei-Mantey K. & Strzepek N. L. The Economic Impact of Climate Change on Road Infrastructure in Ghana. *Sustainability.* Pp 11949-11966.
Declaration on the Right to Development adopted by United Nations General Assembly resolution 41/128 of 4 December 1986. Available at http://www.un.org/documents/ga/res/41/a41r128.htm

The Mandate of the Federal Ministry of Works as stated on the website of the Ministry http://pwh.gov.ng/index?what=19&title=Our%20Mandate

United Nations Environment Programme (2009). Buildings and Climate Change: Summary for Decision-Makers. Available at http://www.unep.org/sbci/pdfs/SBCI-BCCSummary.pdf

UNOPS (2012). *UNOPS Policy for Sustainable Infrastructure.* Available at https://www.unops.org/SiteCollectionDocuments/Multimedia/Rio/unops_policy_for_sustainable_infrastructure.pdf