

Evaluating the Nigerian Government's Financial Obligations to Climate Change Adaptation Strategies

By

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Abstract

There is ample evidence in the literature that developing countries would suffer the most from the adverse effects of climate change. Although, respective developing economies have dedicated action plans to mitigate or adapt to these adverse effects, financing for these strategies may be lacking or national governments may not commit financial resources to actualizing these strategies. Using a Budget Analysis and Climate Budget Tagging framework, the paper evaluates the financial resources the Nigerian government has committed to its adaptation strategies as stipulated in the 2011 National Adaptation Strategy and Plan of Action on Climate Change (NASPA – CCN). The study found out amongst others that, government expenditure on climate change tends to be more of mitigation than adaptation. In addition, adaptation programs targeted at the industry, commerce, telecommunications and transport sector are most neglected among other sectors highlighted as priority sectors in the NASPA – CCN policy. Lastly, we did not find any substantial evidence to support the argument for progressive achievements in financial resources allocated to adaptation programs in the budget. We recommended the need for simultaneously priorities both mitigation and adaptation programs, inculcate adaptation programs in future development plans and leaning towards international financing options during recessions and periods of low revenues.

1. Overview

For developing economies, adaptation to climate change challenges is now recognized as a key factor in determining the future outcomes of climate change impacts and mitigation strategies (Lobell, 2008). The literature on the challenges of climate change reveals that developing countries are more susceptible to risks arising from climate change. The reasons put forward are that these countries do not have the adaptive capacity to limit these risks (Moser & Ekstrom, 2010), and have economies that tend to depend greatly on climate change sensitive sectors (Lim, et al., 2004). Thus, a majority of the literature for developing economies focus on providing evidence based research on the socio – economic and political factors that limit adaptation strategies while controlling for the idiosyncrasies of each developing country.

In defining climate change adaptation, one must recognize that adaptation, as a concept is not strictly exclusive to issues bordering on climate change. A conventional working definition by the International Panel on Climate Change (IPCC) defines adaptation as, “the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates

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harm or exploits beneficial opportunities” (Lobell, 2014). Moser and Ekstrom (2010) defined adaptation to include changes in the social – ecological system to anticipated and actual impacts of climate change, with these changes ranging from short term coping mechanisms to long term structural transformations. From both definitions, climate change adaptation implicitly implies substantive changes in consumption and production processes, which may have significant welfare implications and require deliberate involvement in planning for expected outcomes, scope and scale of adaptation strategies.

Therefore, in managing the accompanying risks of climate change, policymakers, prior to the first decade of the 21st century, focused mainly on strategies aimed at mitigation rather than adaptation (New et al., 2011). The emphasis then, was to reduce the potential negative size of climate change effects on the social – ecological system (Stafford et al., 2011). However, climate change challenges are time bounded. While the effects of climate change occur in the future – long term, the time bounds of mitigation strategies are often linked with the office term limits of decision makers and public servants – mostly four years and in the short term. Consequently, this time lag ensures that current mitigation strategies may not prevent the occurrence of future climate change challenges (Adger 2006). This necessitates the focus of climate change adaptation strategies.

There is adequate evidence on the negative impacts of climate change in Nigeria. NIMET (2008) noted significant weather related disasters with the expectation of a continued trend. Also observed is the high predisposition of Nigeria’s natural and agricultural systems to climate change, with recorded incidence of flood and draught in the past four decades. To effectively respond to these challenges, the Nigerian government developed the National Adaptation Strategy and Plan of Action on Climate Change (NASPA – CCN) in 2011. This plan is designed as an integrated component of sustainable development, with the goal of reducing climate change vulnerabilities and impacts; improving adaptive capacities; leveraging new opportunities and facilitating stakeholder’s collaboration. Key in achieving these objectives is the funding responsibility of the Federal Government of Nigeria, as mandated in the NASPA – CCN. Effective implementation of the policy overtime is expected to significantly tackle the already existing challenges of climate change, while adequately preparing the social – ecology system for future challenges.

Assuming the federal government considers as a priority, the objectives of the NASPA – CCN, the federal governments’ (public) budgets should, in turn, reflect the prioritization of these objectives. This assertion becomes the basis for a critical assessment of government’s ability to fulfil its funding responsibilities of the adaptation policy. Consequently, the paper intends to match adaptation strategies to the budgetary commitments by tracking and characterizing climate – change adaptation expenditures in Nigeria’s budgetary system. Using the Appropriation Acts of 2013 through 2020, we intend to provide answers to the following questions; (1) what type of adaptation strategies has the federal government been committed to implementing? (2) Evaluate the nature of adaptation interventions in the budget in comparison with those stipulated in the NASPA – CCN policy? and (3) Is expenditure on climate change adaptation interventions reflect an effort towards progressive achievements? Progressive achievement here reflects the assumption that the budget is a developmental tool and should reflect quantifiable developments in the adaptation strategies over time.

2. Literature Review

The associated challenges of climate change is well documented in the literature (World Bank, 2010). What is of most concern to researchers and policy makers is, how these challenges affect countries unevenly, and the adaptation and mitigations strategies that can alleviate these challenges. According to UNDP (2007), the emphasis on mitigation and adaptation strategies is paramount, as it is the poorest countries – especially countries in Sub – Saharan Africa – that are most vulnerable to these climate change challenges. Thus, to successfully adapt, decision makers in these poor economies are faced with limited options and constraints, which could reduce the potential damage of climate change.

From the literature, some of the constraints faced by policy makers include; inadequate information, characterized by a dearth of easily available data (Ford et al, 2016; Ziervogel, Johnson, Matthew, & Mukheibir, 2010); the complexity of planning for adaptation, considering seasonal and annual variabilities that require a wide range of policy response (Mukheibir, Kuruppu, Gero, & Herriman, 2013); existence of policy gaps due to dominance by central governments, weak institutions and non-inclusiveness of adaptation strategies (Ampaire et al., 2017); the difficulty in monitoring progress in adaptation due to conflicting metrics for measurement (Brooks et al., 2013; Ford et al., 2015); the time differences between success of adaptation and adaption program timescales(Adger 2006; Challinor et al., 2007); and needed clarity between reduced vulnerability, enhanced adaptive capacity and improved resilience, which are different targets for adaptation strategies (Thorarinsdottir & de Bruin, 2016).

A major source of challenge to adaptation strategies for developing economies is funding. Although the returns of a successful adaptation is substantial, limited financial resources for developing economies may constrain the effective implementation of current and future adaptation measures (UNEP, 2016; UNDP, 2016b). The World Bank expects a financial cost of \$10 – 40 billion annually for developing economies and three times that amount by the UN Framework Convention on Climate Change (UNFCCC) (UNFP, 2009), with Fankhauser (2010) arguing that these cost outlays are grossly underestimated. Recent data from UNEP (2016) estimates \$1140 – 300 billion annually, with the possibility of reaching \$500 billion by 2050. These figures are only indicative of the financial needs of developing countries, with existing conceptual and practical challenges in actually tracking adaptation financing, especially in developing economies. These challenges are due to a lack of consistency and quality data as well as the complexity in differentiating between mitigation and adaptation financing (UNFCCC, 2018; CPI, 2018).

Although the flow of financial resources towards adaptation, mostly stems from developed to developing economies (UNFPA, 2009), sources of adaptation finance could vary between individual country's commitment to financing (through the budget), to international sources of financing and private or public institutions. International financial sources like the UNFCCC's dedicated climate change fund Global Environment Facility (GEF), have been criticized based on its inadequacies in providing adequate funding; governance structure that undermines ownership of the funds by low income countries; and a high transaction costs associated with these funds (Ayers, 2009). Research has also shown that, although there are a wide ranging multilateral, bilateral, and DFIs funding available (ODI, 2017), developing countries face significant obstacles in planning for, assessing and delivering climate finance, even when dealing with multilateral climate funds (Burmeister, Cochu, Hausotter, & Stahr, 2019). Also, the various requirements for accessing these international source of funds can be demanding, often requiring stringent conditions. This has led to the consideration of domestic adaptation finance sources.

The UNDP (2015) listed some of these domestic sources to include finance from national and sub – national governments. These finances could be raised through specific carbon taxes or provided for in budgets. From the literature on climate change adaptation finance, there is a limited focus on financing from national governments, with a preference in the literature for international financing (CPI, 2017). Despite the literature leaning towards international financing, the Climate Public Expenditures and Institutional Review (CPEIR) has provided a tool for tracking domestic expenditure on climate change adaptation. This tool allows for the use of both qualitative and quantitative methods in analyzing the structure, trend and priorities given to adaptation strategies. Tracking domestic adaptation expenditures is an important process of prioritizing allocation and identifying financing gaps. It provides the benchmark for assessing expenditures as well as advocating for further expenditures (CPI, 2018).

Resch et al., (2017) and Buckley (2014) both agreed on the need for developing the capacity of developing economies to track adaptation finance. This ensures the quality of data and the possible integrating of adaptation strategies in respective country's national planning documents. Given that adaptation finance in developing economies is likely to be from domestic public finance, there is a need for a focus on adaptive methodologies for tracking these finances. Resch et al., (2016) provided some basic methodologies which developing economies may use for tracking adaptation finance; Budget analysis, Public Expenditure Review, and Budget tagging. As adapted from Resch et al. (2017), Table 1 provides a comparison of these different adaptation expenditure-tracking methodologies.

Table 1: Comparisons of Various Methodologies for Tracking Adaptation Expenditure

Features	Budget Analysis	Public Expenditure Review	Budget Tagging
Easy to Implement (does not require capacity building)	Positive	Negative	Positive
Quick	Positive	Negative	Positive
Cost Effective	Positive	Negative	Neutral
Standardization (allows for cross - country comparison)	Neutral	Positive	Neutral
Encompasses full budget cycle	Negative	Negative	Positive
Can be integrated into budgeting process	Positive	Negative	Positive
Independent from timely publication of budget data	Negative	Negative	Positive
independent from sufficiently disaggregated data	Negative	Negative	Neutral
Enables comparison of different levels & composition of expenditures against objectives	Negative	Positive	Negative

Source: Adapted from Resch et al., (2017). Note, positive, neutral and negative describes the advantages (positive) and disadvantages (negative) each methodology given a feature category.

Resch et al. (2017) defined budgetary analysis as an approach that covers budgetary proposal and actual expenditures. Developing countries often use this methodology due to its low cost. However, the available studies that have employed this methodology focused on South Asia (ACT, 2018), Afghanistan and India: Kerala, Chhattisgarh, and Bihar (Allan et al. 2016). In using the public expenditure methodology, Micale, Tonkonogy, & Mazza (2018) criticized it based on being time consuming and expensive. Nevertheless, they noted that the method is normally used at the national and sub – national government level. The method has been applied in Bangladesh, Cambodia, China, Fiji, Kiribati, Morocco, Indonesia, Nepal, Thailand, Tonga, Vietnam and Pakistan (Resch et al. 2017; UNDP 2016a, 2015 and 2012). The budget tagging methodology is more precise in capturing allocation weaknesses in tracking adaptation financing. It is an approach that flags budget codes that are relevant to adaptation in the government's financial system (Micale, Tonkonogy, & Mazza, 2018). This method has been used for the Philippines, Nepal, Indonesia and Bangladesh (Micale, Tonkonogy, & Mazza, 2018; UNDP, 2015).

With respect to broader issues that affect financing adaptation financing, Barr et al (2010) backed the allocation of adaptation finance in a transparent, efficient and equitable way in order to ensure best returns from financing adaptation strategies. They argued that adaptation finance should be allocated based on the climate change impacts experienced in a country, a country's adaptive capacity and its implementation capacity. Some scholars have also opined that the effects of adaptation strategies on the adverse impacts of climate change, is similar when countries promote pro – poor inclusive growth (Bowen, Cochrane, & Fankhauser, 2012). This implies that a lower adaptive capacity present in

developing economies would in most cases; limit the expected positive impact of adaptation strategies. Thus, Barr et al. (2010) argued that adaptation strategies would be more effective in such counties when strategies that improve institutions, health sector, education and the financial sector – where all these sectors are closely linked to inclusive growth. Thus, financing for adaptation strategies, would implicitly involve financing pro – poor growth (Dodman, Ayers and Huq, 2009).

For developing economies, the agricultural sector plays a dominant role in reducing the incidence of poverty. However, the agricultural sector is most vulnerable to climate change. Barry and Skinner (2002) noted that adaptation strategies in the agriculture sector should include the financing of technological developments, government programs and insurance, innovative farm production practices and farm financial management. Financing these aspects would ensure that adaptation strategies are effective. However, there is evidence that financing these adaptation strategies are constrained by the option between potential adaptation options, government decisions that direct financial resources to adaptation strategies and risks associated to loss of limited financial resources.

In summary, the reviewed literature showed that developing countries are increasingly turning away from international sources of financing climate – change adaptation strategies to domestic public financing. A major reason for this is the relative difficulty associated with these international financing sources. However, a common conclusion from the literature is the importance of having adequate financial resources, and the need for tracking, monitoring and tagging all expenditure on adaptation. This places emphasis on the possibility of identifying financial gaps and prioritizing expenditure for adaptation. On the three methodologies commonly used to assess financing for adaptation, there are limited studies in the literature that integrated these methods, with most studies using any of each method on a standalone basis. In addition, the use of these methodologies in developing economies lean more towards countries in South Asia and Middle East. We were unable to find any documented use of these methodologies for Nigeria.

3. Methodology

The paper employs a hybrid methodology, which applies OECD Development Assistance Committee (DAC) (OECD, 2011) Climate Budget Tagging (CBT) tool in a Budget Analysis Framework³. In employing this methodology, we link climate – change adaptation strategies to Federal Government’s budgetary commitments to its climate change adaptation policy. The CBT allows for the compilation of comprehensive data on climate change spending, enabling policy makers to make informed decisions and prioritize climate investments (Le, 2015). The CBT is also provides some advantage in its provision for public scrutiny of government’s spending towards addressing climate change issues. Following the guidelines in OECD-DAC (2011) and EBRD (2014), for the effective use of the CBT tool in a budget analysis framework, the following components of the CBT must first be established; (a) Definition of climate change adaptation activities/markers; (b) Classification of climate change adaptation expenditures; (c) Weighing of relevance of adaptation interventions; and (d) Designing the tagging procedure. OECD – DAC (2011) provides clear definitions on the definitions and classifications (see Table 2) and the scoring/weighing and tagging procedures (See Figure 1 and Table 3). Detailed analysis using data from the four components of the CBT will provide answers to questions 1 and 2.

Table 2: Climate Change Adaptation Markers and Classification of Expenditures

Definition of activities;	Clarification;
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³ The Budget analysis framework to be used is based on the guidelines of Dignity Counts. See Fundar – Centro de Análisis e Investigación, International Human Rights Internship Program and International Budget Project (2004). *Dignity Counts: A Guide to Using Budget Analysis to Advance Human Rights*. Fundar

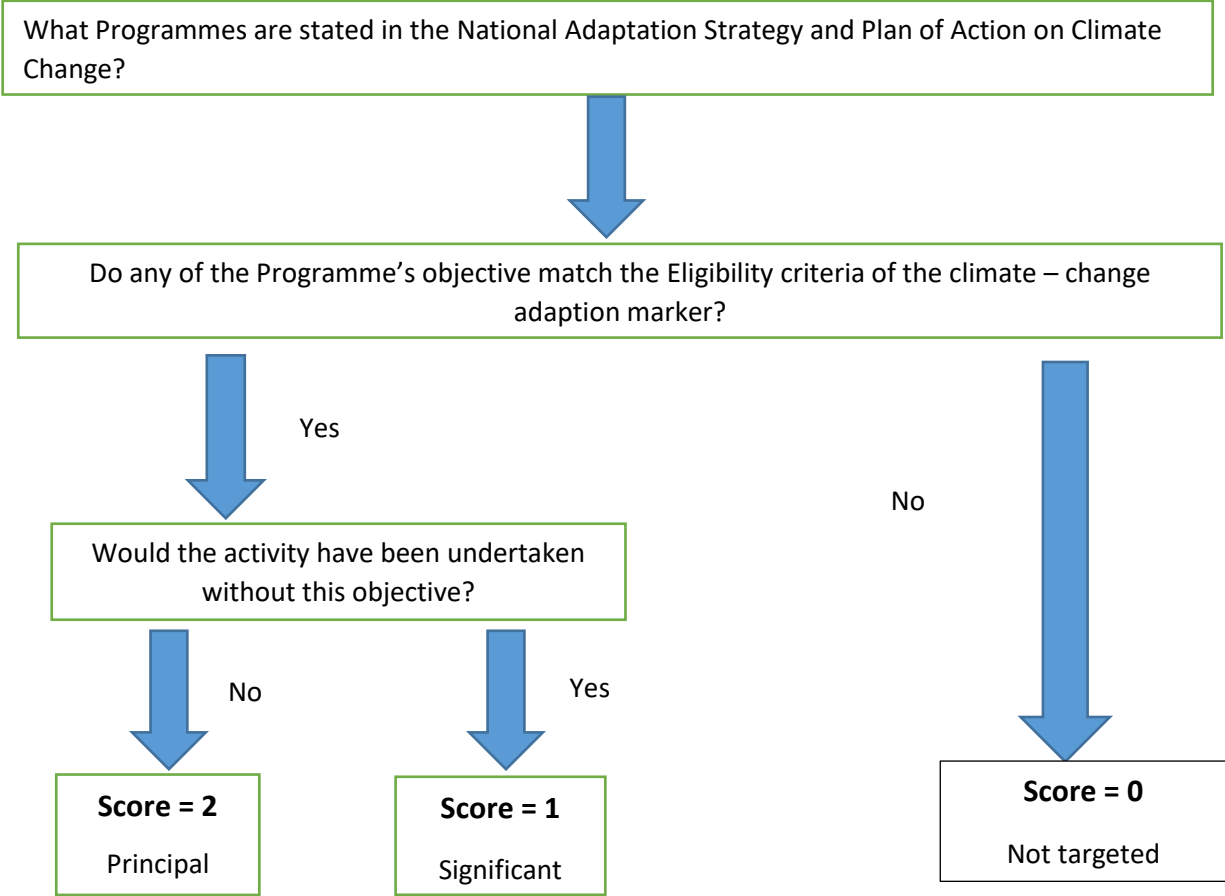
<p>An activity should be classified as adaptation related, if:</p>	<p>It intends to reduce the vulnerability of human or natural systems to the impacts of climate change and climate-related risks, by maintaining or increasing adaptive capacity and resilience. This encompasses a range of activities from information and knowledge generation, to capacity development, planning and the implementation of climate change adaptation actions.</p>
<p>Eligibility of Activity; An activity is eligible for the climate change adaptation marker if;</p>	<p>Clarification:</p> <ul style="list-style-type: none"> a) the climate change adaptation objective is explicitly indicated in the activity documentation; and b) the activity contains specific measures targeting the definition above. Carrying out a climate change adaptation analysis, either separately or as an integral part of agencies' standard procedures, facilitates this approach.

Source: OECD – DAC (2011)

The adaptation markers and scoring format aims at monitoring financial flows to adaptation programs, whose objectives are specifically aimed at climate change adaptation. The weighing/scoring schema provides in figure 1, uses questions to track financing to policy objective. A principal objective is weighted higher than other objectives, when the funded adaptation activity would not have been funded, if not for its objective. Conversely, a significant objective is scored lower than a principal objective, when an adaptation activity has other objectives, but these objectives are formulated to help meet adaptation concerns. Financing figures arrived at by the marker/activity classification and the scoring system for both principal and significant objectives are regarded as estimates (an upper bound) of adaptation financing (OECD – DAC, 2011).

To derive the scores for adaptation programs, we created a scoring procedure that acts as a guide when scrutinizing each Ministry, Agency, and Department (MDAs). The scoring procedure (Table 3) matches each MDAs budgetary allocations to targeted sectors that have identified by the National Adaptation Strategy and Plan of Action on Climate Change as beneficiaries of adaptation programs. For example, for the Ministry of Health, it is intuitive to expect that adaptation activities captured in the Ministry's budget would have both principal and significant objectives in agriculture, fisheries, biodiversity, freshwater resources etc. We limit our scrutiny of budgets to the periods 2013 – 2020. The choice of starting from 2013 is justified on the basis that the National Adaptation Strategy and Plan of Action on Climate Change was introduced in 2011. Although the budgets of 2015 and 2016 were included in the period of interest, we recognize that Nigeria was in a recession in 2015 and the budget for 2016 is expected to prioritize economic recovery programs over climate change adaptation programs.

Figure 1: Weighing/Scoring system for Adaptation Markers/Activity



Source: OECD – DAC (2011)

Table 3: Expected Scoring procedure for MDAs

MDAs	Budget ID	Project Title	Status	Amount	Agriculture (Crops and Livestock)	Freshwater Resources, Coastal Water Resources and Fisheries	Forests	Biodiversity	Health and Sanitation	Human Settlements and Housing	Energy	Transport and Communications	Industry and Commerce	Disaster, Migration and Security	Livelihood	Vulnerable Groups	Education
Agriculture	X	X	New/Ongoing		X	X	X	X	X	X			X	X	X	X	
Aviation	X	X	New/Ongoing									X	X		X		
Education	X	X	New/Ongoing		X	X	X	X	X	X				X	X	X	X
Energy	X	X	New/Ongoing		X	X	X	X		X	X	X	X		X	X	
Environment	X	X	New/Ongoing		X	X	X	X	X	X	X	X	X	X	X	X	X
Health	X	X	New/Ongoing		X	X	X	X	X	X				X	X	X	X
Information and Culture	X	X	New/Ongoing		X	X	X	X	X	X	X			X		X	X
Interior	X	X	New/Ongoing						X			X	X	X	X	X	
Labour and Productivity	X	X	New/Ongoing		X					X	X	X	X			X	
Mines and Steel Development	X	X	New/Ongoing				X	X			X	X	X	X	X		
Tourism, Culture and National Orientation	X	X	New/Ongoing							X		X	X	X	X		
Niger Delta	X	X	New/Ongoing		X	X	X	X	X	X	X		X	X	X		
NDDC	X	X	New/Ongoing		X	X	X	X	X	X	X		X	X	X		
Ecological Fund	X	X	New/Ongoing		X	X	X	X	X	X	X		X	X	X		
Petroleum Resources	X	X	New/Ongoing		X	X	X	X	X	X	X	X	X	X	X	X	
Works and Housing	X	X	New/Ongoing						X	X	X				X	X	
Power	X	X	New/Ongoing						X	X	X	X	X		X	X	
Water Resources	X	X	New/Ongoing		X	X	X	X	X	X				X	X	X	X
Women Affairs	X	X	New/Ongoing		X	X	X	X	X	X				X	X	X	X

Source: Adapted from OECD – DAC (2011)

The second half of our hybrid methodology involves the use of a budget analysis framework. We employed this framework to determine if there has been progressive achievements in the federal government’s commitment to financing adaptation strategies. The total budgetary expenditure on adaptation strategies was collated, adjusted for inflation and disaggregated by priority sectors (agriculture, water resources, forests, biodiversity, health and sanitation, human settlements and housing, energy, transport and communication, industry and commerce, disaster, migration and security, livelihood, vulnerable groups, and education) as stipulated in the NASPA – CCN policy framework. This approach will provide answers to question 3.

The use of such budget analysis framework is not without its limitations. Political and philosophical questions cannot be answered using this methodology. Following Schuftan (2005) arguments, a budget analysis framework may provide answers to question of what has been or what is being spent by the government, but cannot answer questions of what should be spent. Additionally, effectiveness and efficiency in the implementation of adaptation activities cannot be determined using this methodology. Proponents of this method strongly advocate for the use of complementary sectoral information and actual field observations on the operationalization of the budget when drawing inference (Schuftan, 2005). Another important limitation on the application of this method to climate change adaptation financing, is the dearth of quality data on actual expenditures. We circumvent this problem by using budgetary allocations to adaptation activities as a measure of financial commitment.

4. Findings

A starting point for providing answers to the questions posed in this paper is the collation of climate change financial data from budget documents of various years, and differentiating between mitigation and adaptation programs in these budgets. For the later, the paper depends on the OECD (2011) CBT’s definition of what programs constitute mitigation and adaptation. According to OECD (2011), programs are tagged mitigation if programs contribute to the stabilization of climate change shocks, while programs tagged as adaptation strategies are intended to reduce the vulnerabilities to climate change shocks. Implicitly, OECD (2011) definitions imply a long term gestation period for adaptation programs, given the possibility of a time lag between current climate change shock and evolving adverse impacts in the future (Fazey, et al., 2010; Cooper, et al., 2013). The data on adaptation programs was collected sequentially. First, we highlighted all programs in the budgets that were directly linked to coping with climate change shocks. Thereafter, we separated adaptation programs by following the OECD (2011) definitions. Table 4 provides a summary of the data collected in both sequences.

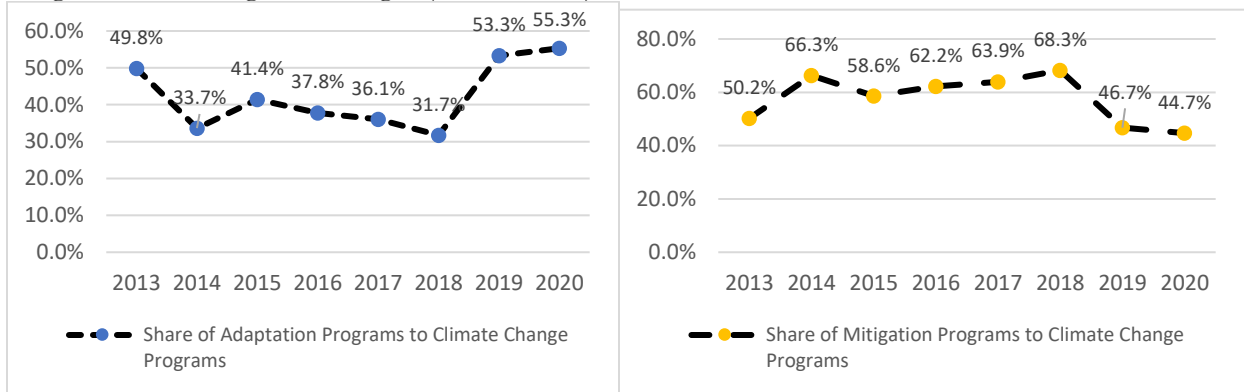
Table 4: Selected Climate Change Mitigation and Adaptation Programs in the Nigerian Budget (2013 – 2020)

Year	Number of Climate Change Programs	Number of Mitigation Programs	Number of Adaptation Programs
2013	560	281	279
2014	508	337	171
2015	582	341	241
2016	780	485	295
2017	524	335	189
2018	671	458	213
2019	274	128	146
2020	282	126	156

Total	4181	2491	1690
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Source: Authors' Compilation from 2013 – 2020 Nigerian Budgets.

Figure 2: Shares of Unadjusted Adaptation and Mitigation Programs to Total Climate Change Programs in the Nigerian Budget (2013 – 2020)



Source: Authors' Compilation from 2013 – 2020 Nigerian Budgets

Figure 3: Shares of Adjusted Adaptation and Mitigation Programs to Total Climate Change Programs in the Nigerian Budget (2013 – 2020)

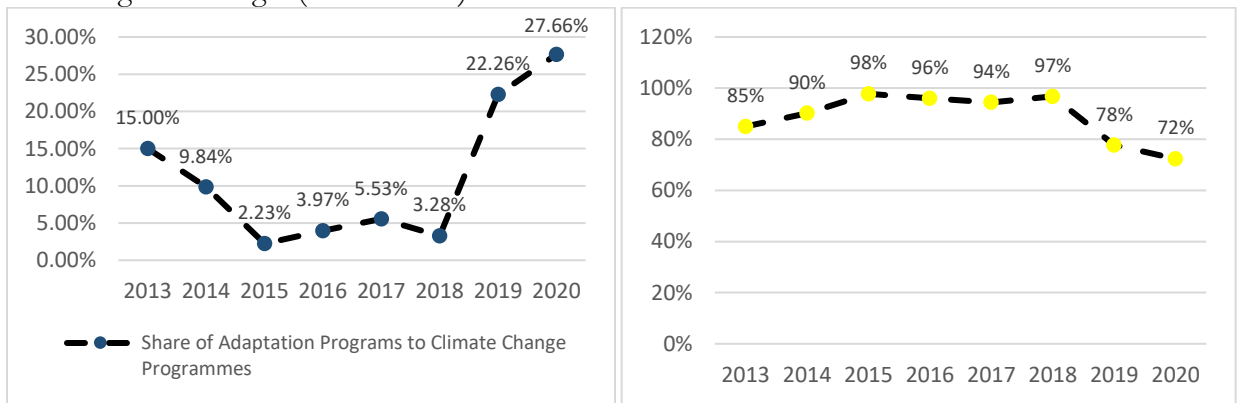


Table 4 indicates a relative preference for mitigation programs over adaptation programs, although this preference has begun to change from 2019. For each budget year, the number of mitigation programs surpassed the number of adaptation programs, except in 2019 and 2020. Figure 3 highlights the comparative differences between the federal government's choices of mitigation over adaptation. A closer look at the type of adaptation programs in respective year budgets indicate that a majority of adaptation programs are either flood control, erosion control or irrigation projects. When controlled for these three types of programs, the share of adaptation programs to all climate change efforts significantly reduces, compared to Mitigation Programs (see Figure 3). When scaled with the number of climate change programs, the share of mitigation programs consistently remained above 70% of total climate change programs. In contrast, the share of adaptation programs fell from 15% in 2013 to 2.23% in 2015, but rebounded moderately to 27.66% as at 2020. This indicates the overwhelming preference for flood control, erosion control and irrigation projects as core adaptation strategies. A plausible reason for the choice of these programs can be attributed to the susceptibility of Nigeria's rain fed agricultural output and yield to adverse climate change shocks (Hider, 2019), and a commitment to reducing this vulnerability as stated in Nigeria's third communication to the UNFCCC (Federal Ministry of Environment, 2020).

The rationale for adaptation programs arises from the fact that the adverse effects of climate change shocks are time bounded. The effects of these shocks often become visible in the future, which necessitate the need for longer term corrective measures. However, due to office term limits of decision makers and public servants – mostly four years and in the short term – decisions regarding how to deal with climate change shocks (choice to mitigate or adapt) would often depend on the expected tenure of the decision maker (Adger 2006). In Nigeria, there is documented evidence of the high turnover in expected tenure limits for appointed and elected decision makers in the bureaucracy (Fashagba, 2009; Omotola, 2010; Olorunmola, 2016), which limits the options of political decision makers to favour choices with expected immediate impacts over choices with longer term impacts (De Mesquita, 2002; Urwin and Jordan, 2008).

The other contributory reason for the preference for mitigation programs is the selection of constituency programs by members of the parliament. The members of the Nigerian parliament are by law allowed to delegate constituency projects to bureaucrats for implementation. Rogger (2014) notes that the choice of constituency projects among parliamentarians in Nigeria are mostly influenced by the degree of political competition and re-election risks. As such, regarding the adverse impacts of climate change, parliamentarians often lean towards projects that mitigate the immediate concerns of the electorates, especially when there is a high risk of losing elections. This preference for programs that deal with immediate climate change challenges ensures that constituency projects become more of mitigation rather than adaptation measures. For example, when we categories mitigation programs into the provision of boreholes and street lightning, each of these two categories account for 863 and 549 programs respectively. When combined, the two programs make up approximately 83% of all adaptation programs but 56% of mitigation programs in the budgets from 2013 to 2020. Apart from the conspicuous dominance of these program categories in the budget, the choice of these categories is premised on the documented impact of climate change on access to water for farming and livelihood, the adverse effects of erosion of farm harvests, and limited access to electricity (NIMET, 2008).

Table 5: Number of Mitigation Programs by Categories (2013 – 2020)

Budget Year	Boreholes	Street Lights
2013	193	32
2014	33	63
2015	72	35
2016	241	45
2017	121	147
2018	141	226
2019	24	0
2020	38	1
Total	863	549

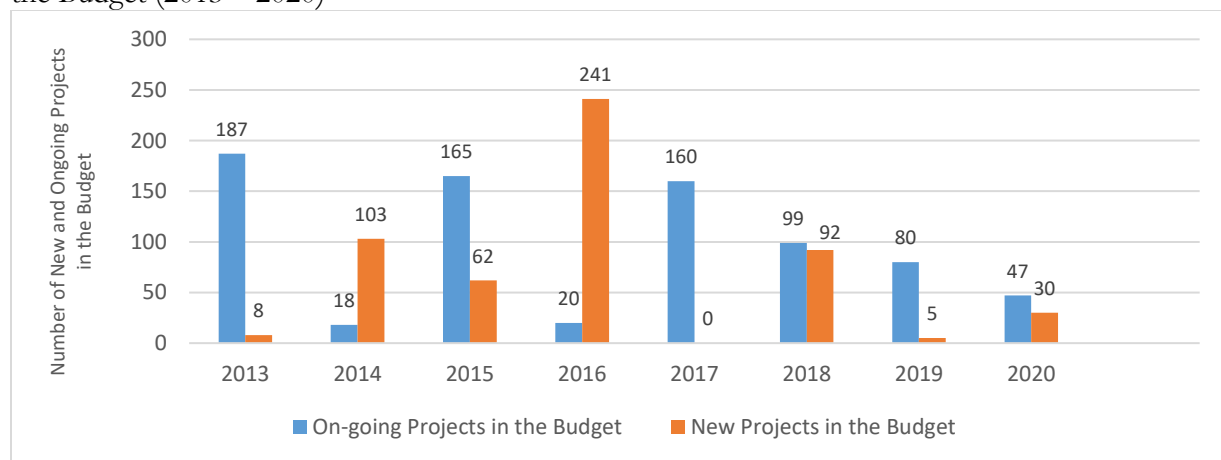
Source: Authors' Compilation from 2013 – 2020 Nigerian Budgets

Although the data suggests the federal government's preference for mitigation programs over adaptation programs, there is ample evidence from budget data that the government remained committed to funding adaptation programs. However, the question therefore is what is the nature of these adaptation projects and how do they align to projects stipulated in the NASPA – CCN policy? Given the dominance of irrigation projects and erosion and flood control programs in the budget, we present an unadjusted and adjusted findings from employing the Climate Budget Tagging tool in two

ways. The weighted scores presented in the unadjusted CBT, recognizes all the adaptation programs in the budget. On the other hand, in the adjusted CBT, we neglect the scoring of irrigation projects, erosion control and flood control in the budgets. The choice of an adjusted and unadjusted CBT tool is premised first on the overriding influence of the three programs on the number of identified climate change adaptation programs. Restricting the analysis of the CBT scoring to an unadjusted data, may also exclude possible insights regarding other adaptation programs. In addition, Nigeria’s communication to the UNFCCC is clear on the significant objective regarding the choice of these programs - to reduce vulnerabilities in the agricultural sector, human settlement, livelihood and disaster. Secondly, according to OECD (2011), these programs do not automatically qualify as an adaptation program. There must be sufficient evidence from the objectives of the programs to justify that the activities associated with flood control, erosion control and irrigation projects, contribute significantly to climate change adaptation.

The CBT scores by year and adaptation program, for both the unadjusted and adjusted budget data are presented in Figure 5. For the yearly CBT scores for the unadjusted budget data, the trend in scores show a continuous decline. This implies that the cumulative commitment towards principal and significant policy objectives towards climate change adaptation is on the decline. However, when we considered the declining number of flood control, erosion control and irrigation projects (FEI) in the adjusted data (figure 4), there is a change in the trajectory of policy commitment, especially from 2019. The increase in the CBT score in 2019 and 2020, irrespective of the dominance of the FEI programs, underscores the government’s intent on accommodating other types of adaptation programs. In the unadjusted budget data that accounts for the FEI type programs, Agriculture, Human Settlement and Housing, Livelihood, and Disaster, Migration and Security had the highest CBT scores. However, when we de-emphasised FEI type programs, the targeted sectors benefiting from this more accommodating adaptation programs expanded – Agriculture, Health and Sanitation, Human Settlement and Housing, Energy, Livelihood, Disaster, Migration, and Security, and Vulnerable Groups (Figure 6).

Figure 4: Number of New and Ongoing (Flood, Erosion and Irrigation) FEI Adaptation Programs in the Budget (2013 – 2020)



Source: Authors’ Compilation form 2013 – 2020 Nigerian Budgets

The declining number of FEI projects in the budgets as at 2015 is consistent with the current governments' policy stance towards the completion of all ongoing projects⁴. There is ample evidence in the literature on the abandonment of capital projects and policy discontinuity in Nigeria, especially when there is a change in governance (Williams, 2017; Ihuah and Benebo, 2014). The antecedence of such policy discontinuity has been the concentration of new project over ongoing projects in the budget. Data from the CBT scoring tool shows that the number of new climate change adaptation programs are declining, with the government focusing on completing ongoing programs.

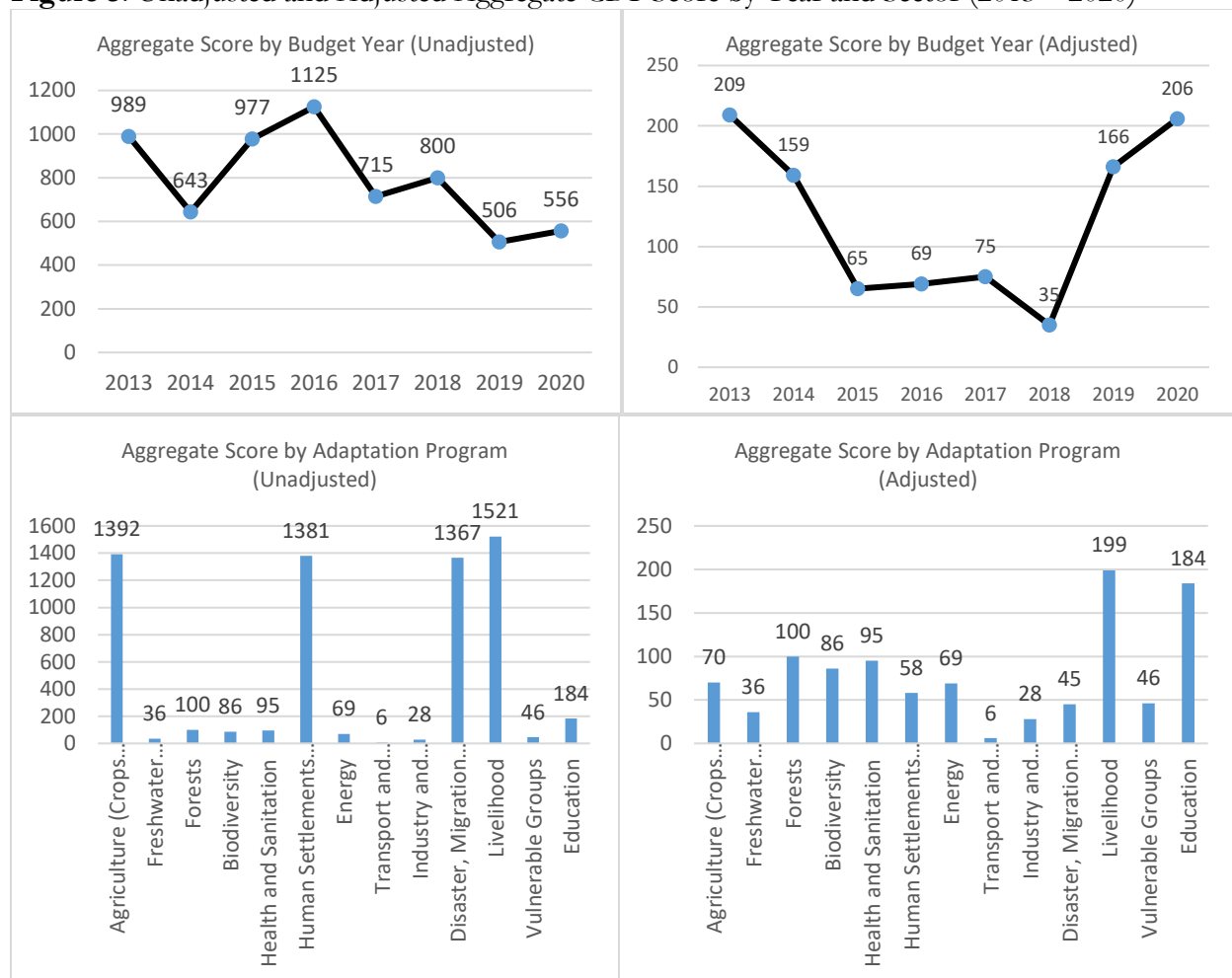
The aggregate score by type of adaptation program gives an insight of the government's prioritization of each adaptation sector. In figure 5 we present both the adjusted and unadjusted CBT scores for each sector as stipulated in the NASPA – CCN policy. As expected, due to the significant number of flood control, erosion control and irrigation projects and the consequent impact on Agriculture, Human Settlement and Housing, Livelihood, and Disaster, Migration and Security, the unadjusted data indicates that climate change adaptation programs in the budget from 2013 to 2020 had prioritized these sectors. Conversely, the adjusted data proffers a more insightful analysis. When we controlled for the FEI type programs, the adjusted data highlights government's efforts towards education, livelihood, forestry, Biodiversity, and health and sanitation. In addition, the transport and communication sector as well as industry and commerce had the lowest scores. The conclusion from both the adjusted and unadjusted budget data is that, despite the concentration of adaption programs on flood control, erosion control and irrigation, the government has proactively de-emphasized these FEI programs by remaining committed to completing already ongoing FEI programs, while expanding the scope of adaptation programs that have both principal and significant impacts on other sectors. Despite this expansion in the scope of adaptation programs, industry, commerce, communication and transport sectors are the least prioritized in the budget from 2013 to 2020.

The low CBT scores for industry and commerce is attributed to the degree of industrialization in Nigeria, which is low and its consequent low GHG emission (Emodi, et al., 2017). Afsah, et al (201) recognizes the limitations of compliance to adaptation and regulatory strategies' to industrial pollution in developing countries like Nigeria, based on the need to first understand the preconditions for such regulations and adaptation strategies. The authors highlight substantial transaction costs, inadequate integrated information, low public mandate and low capacity to implement adaptation strategies regarding climate change shocks. For transport and communication infrastructure, adverse climate change shocks like increases in temperature and rainfall softens the roads, which leads to the damage of such infrastructure. This damage increases the costs of moving people, goods and services and the operations of other sectors that depend on transport and communication infrastructure.

Despite the associated importance of this infrastructure, the CBT scoring tool indicates a relatively low score. A possible reason for this is premised on the type of adaptation programs targeted at the sector. The NASPA – CCN specifically targets the development of alternative route, expansion of highways and improvements in road maintained as adaptation programs. However, following the established criteria for identifying adaptation programs and their objectives, the programs targeted at transportation and communication are very limited. For a majority of the programs which aligned with the NASPA – CCN proposed adaptation programs for transportation and communication, and were included in the budget from 2013 – 2020, their stated objectives (both principal and significant) did not align with the scoring criteria.

⁴ The current administration first got elected in 2015, with the primary focus on completing all ongoing projects. This policy stance was stated in the 2016 Budget Speech and reiterated in subsequent budget speeches.

Figure 5: Unadjusted and Adjusted Aggregate CBT Score by Year and Sector (2013 – 2020)



Source: Authors' Compilation from CBT and 2013 – 2020 Nigerian Budget.

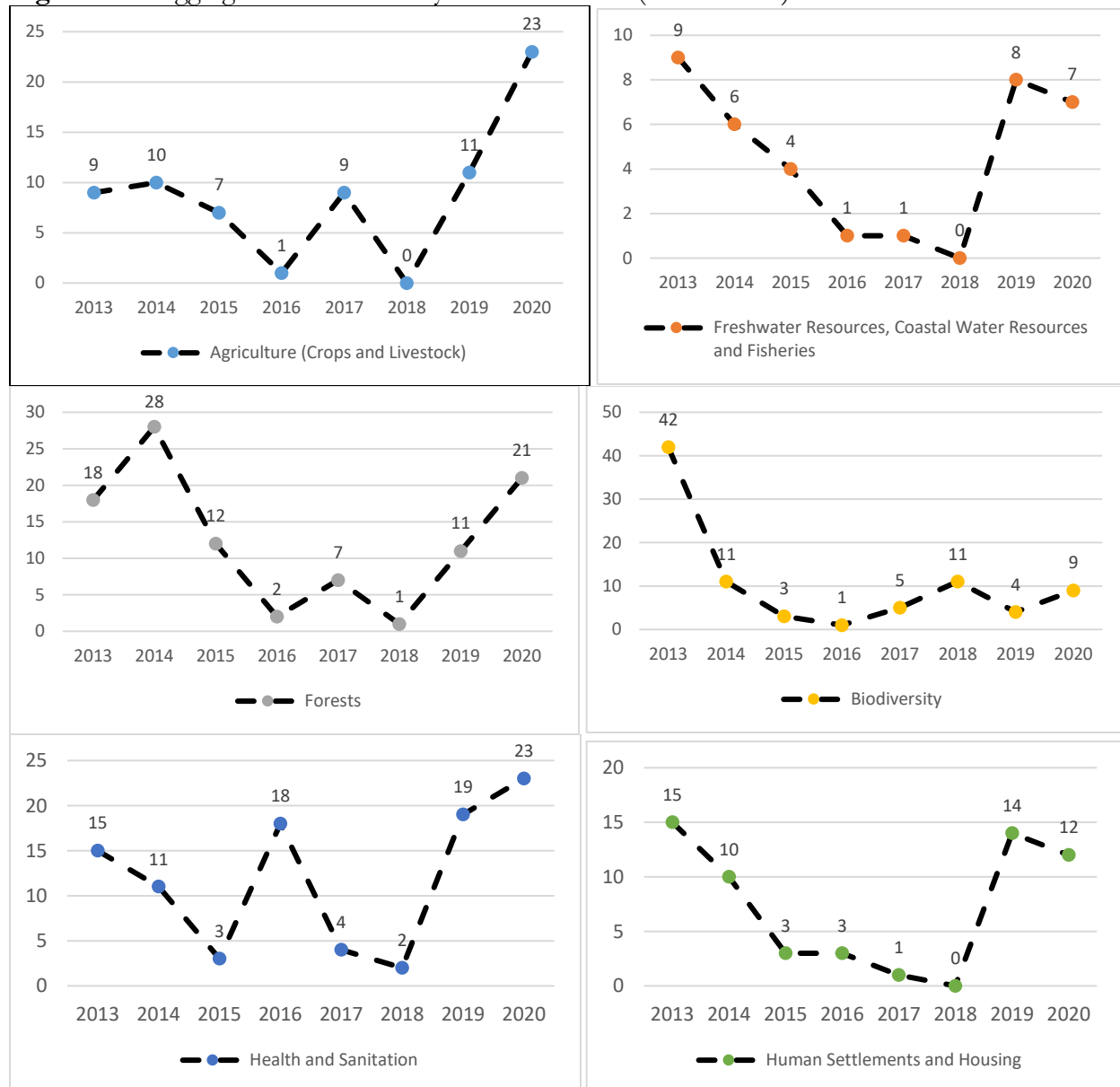
We also present a disaggregated view of the CBT scores for all sectors identified in the NASPA – CCN policy (Figure 6). For this analysis, we used the adjusted data given the overriding effects of the FEI type adaptation programs. Thus, the analysis provided do not include the possible impact of the FEI type adaptation programs on various sectors. However, a preliminary analysis of the unadjusted data indicates that. With the inclusion of the FEI type adaptation programs, only Agriculture, Human Settlements and Housing, Livelihood, and Disaster, Migration and Security are affected. The effects found were also very similar for each of these sectors. The disaggregated view provides a clearer picture of which sector the government prioritizes and possible areas of improvements.

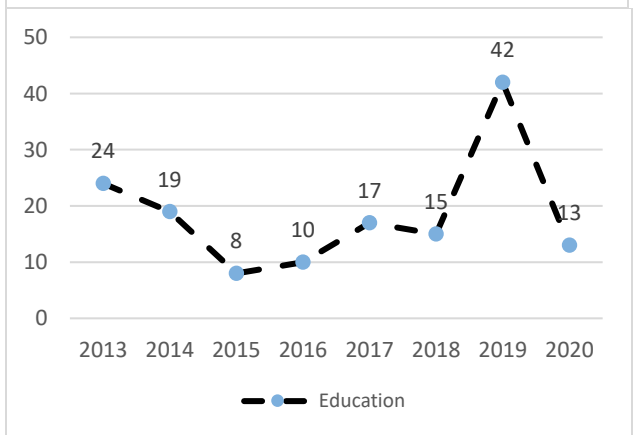
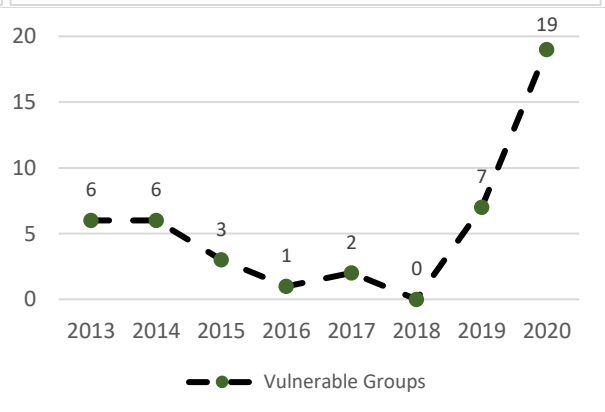
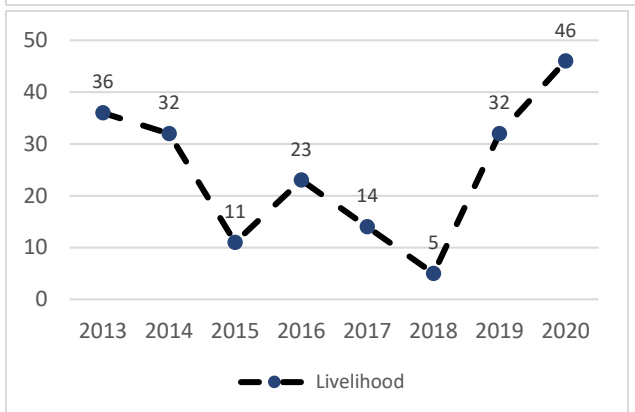
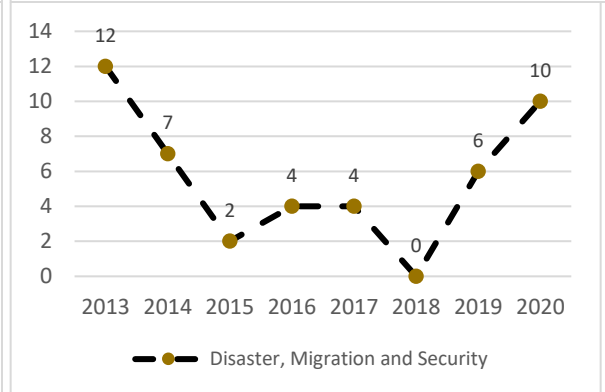
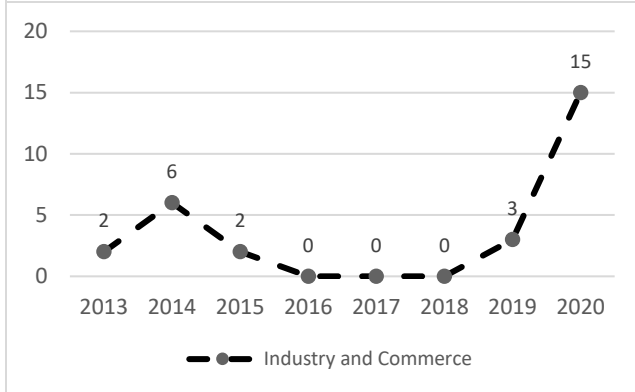
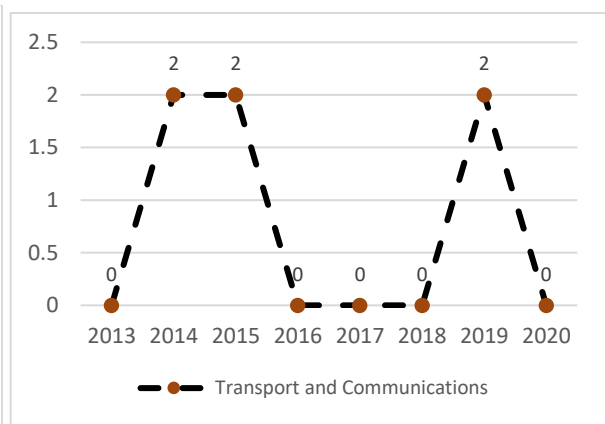
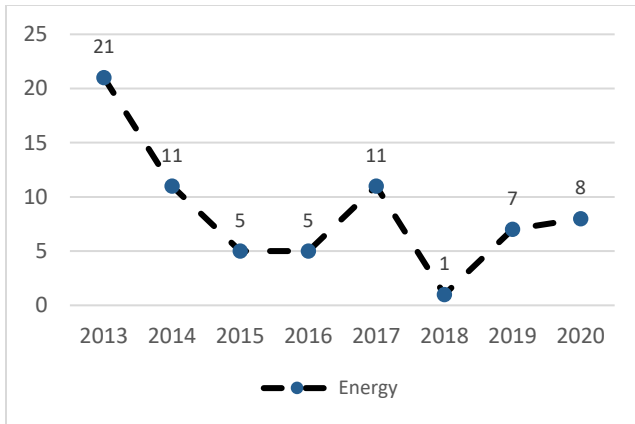
Generally, the scores for most of the sectors were on a decline prior to 2018, with a reversal of the trend in 2019. The decline in the scores may not be disassociated from the government's stance on focusing on completing all ongoing projects. However, we also recognize that Nigeria was in a recession in 2015 and had moderate growth in 2016, which according to Obani and Gupta (2020), in recessions the general perception with regards government policy is to focus on economic recovery, with climate change framed as hampering economic recovery. The intuition is that during periods of recession and economic recovery, developing economies tend to favour programs that support economic growth rather than climate change programs. All sectors except livelihood and education

had low scores for the period of 2015 and 2016. The focus on livelihood and education is consistent with the nature of adverse climate change shocks which predominantly affects livelihood (Amos, et al., 2015), most of which are vulnerable homes (Ebele and Emodi, 2015), which necessitates changing their practices to adapt effectively, through education (Amanchukwu, et al., 2015).

The upshot in adaptation programs from 2018 underscores the need to mitigate negative outcomes of recent climate change shocks in Nigeria. Incidences of increased temperature, flooding, erosion, has promulgated increased occurrence of clashes between farmers and herders in North East Nigeria, low incomes for farming households and increased vulnerability to food security (Haider, 2019). Coupled with the drop in crude oil prices in 2019 and the current global health pandemic in 2020, the government through the Federal Ministry of Environment is committed to upscaling adaptation programs that reduce household vulnerabilities (Federal Ministry of Environment, 2020).

Figure 6: Disaggregated CBT Score by Year and Sector (2013 – 2020)





Source: Authors' Compilation from CBT Scoring Tool

Another important question the paper intends to provide answers to, is the determination of any progressive achievements in the budgetary allocations to climate change adaptation programs. Progressive achievements with regards to climate change adaptation, focuses on budgetary expenditure on adaptation programs, with the aim of attaining the objectives of the NASPA – CCN policy. We first adjust budgetary allocations for inflation to capture the real monetary value of expenditure. A disaggregated expenditure by each priority sector would provide a clearer indication of the requirement of each sector. However, due to the use of the CBT scoring tool, a disaggregated approach may not be feasible. The major challenge is double counting of budgetary allocations for a program which may have impact on more than one priority sector. As such, we only provide the aggregated expenditures, adjust them for inflation.

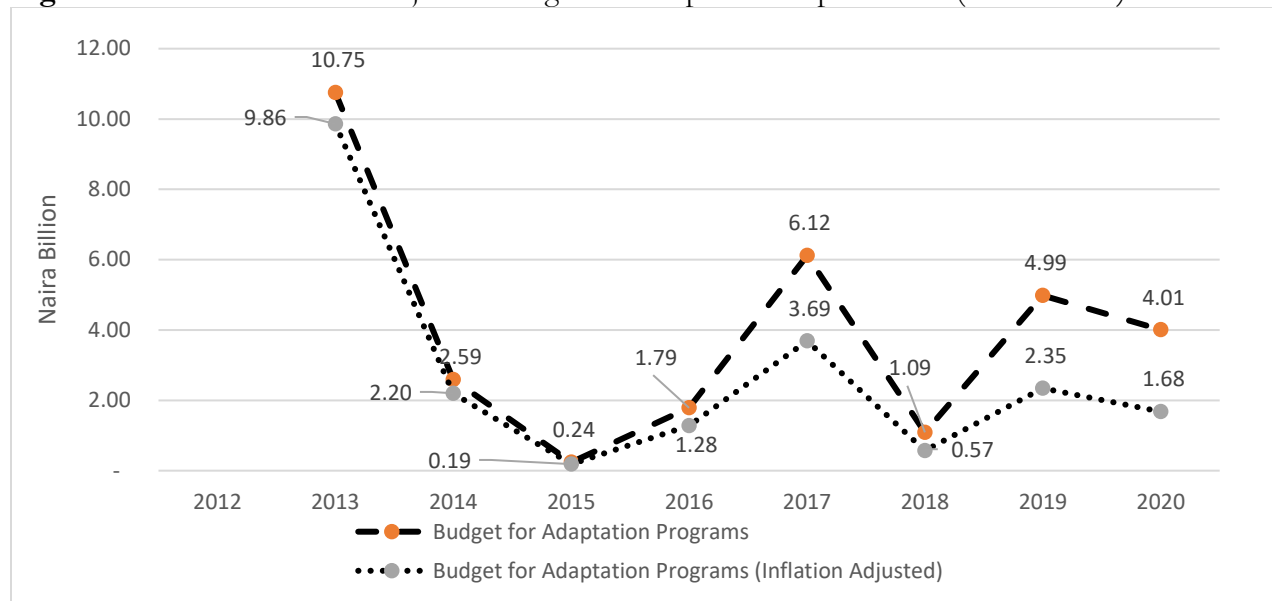
Table 6 provides the aggregate expenditures for all adaptation programs for each year. The trend in allocations indicate a decline in budgetary allocations, despite accounting for a recession year in 2015 and expected recovery in 2016. However, despite the initial large allocation in 2013, the federal government has not been able to replicate this commitment in subsequent years. This is actually worrisome as it does not align with the provisions in the NASPA – CCN policy’s priority implementation action of mobilizing resources. Another concern regarding the priority implementation with regards to mobilizing resources is the focus on international sources of funds for funding adaptation programs. Using Consumer Price Index (CPI), with 2012 as a base year, we adjust the budgetary allocation to reflect the effects of inflation on purchasing power. Figure 7 indicates that growing inflating severely undermines the real purchasing power of budgetary allocations to adaptation programs. Although the degree of reduction in purchasing power is lower in 2013 to 2016, the gap between inflation adjusted and nominal budgetary allocations expanded significantly. The essence of adjusting for inflation underscores the extent to which more funds may need to be allocated to adaptation programs due to the eroding power of inflation. From figure 7, increasing inflation occasioned by adverse economic outcomes, erodes the financial commitments of the federal government towards prioritizing climate change adaptation programs.

Table 6: Aggregate Budget Expenditures for Adaptation and Yearly Share of Adaptation Budget (2013 – 2020)

Year	Total (₦)	Share of Total Adaptation Budget
2013	10,753,404,222	34.05%
2014	2,591,421,756	8.20%
2015	238,646,377	0.76%
2016	1,786,363,620	5.66%
2017	6,122,821,038	19.39%
2018	1,099,037,404	3.48%
2019	4,986,075,679	15.79%
2020	4,006,552,629	12.69%
Total Adaptation Budget (2013 – 2020)	31,584,322,725	

Source: Authors’ Compilation from CBT Scoring Tool and Nigerian 2013 – 2020 Budgets.

Figure 7: Effect of Inflation Adjusted Budget for Adaptation Expenditures (2013 – 2020)



Source: Authors' Compilation from CBT Scoring Tool.

5. Conclusions and Recommendation

Taken together, the data and analysis of the Federal Government's financial commitment to its adaptation program indicate that, the Nigerian government's financial commit has changed in recent times, while some sectors as indicated in the NASPA – CCN policy are prioritized over others. A major finding in the paper is the overwhelming dominance of mitigation programs over adaptation programs. Despite this dominance, the paper also found that the type and structure of programs in the budget align with the objectives of the NASPA – CCN policy. This indicates government's policy consistence with implemented programs. A highlighted reason for this consistency is that a majority of Nigeria's climate change shocks are linked to increased temperatures and increased rainfall, which have significant adverse effects on agriculture and livelihood. We recommend that government prioritize both mitigation and adaptation strategies concurrently, and not neglect other sectors (apart from agriculture and livelihood) which also suffer significantly from climate change shocks.

We also found that specific sectors – transport, telecommunication, industry and commerce are severely lacking in adaptation programs. We noted that a possible reason for this is the small contributions of the manufacturing sector to GDP as well as the slow pace of industrialization in the country. As such, the government does not prioritize the negative externalities that arise from the process of industrialization. However, Nigeria is on the process of becoming a highly industrialized country, given current government economic policy stance. Thus, we recommend that Nigeria's industrialization and commercialization policies (short and long term) should include strategies and programs that are geared towards expected increases in climate change shocks. To remain consistent with the objectives of the NASPA – CCN policy, all future development plans should incorporate international best practices that reduce emissions, mitigate the negative externalities from increased production, and proffer simultaneous adaptation strategies for future climate change shocks.

Government's financial commitment had been on the decline prior to 2018, but has been scaled upwards in 2019 and 2020. The decline in financial commitments in previous years was attributed to the governments' policy stance on completing all ongoing projects, the 2015 recession and a preference for growth stimulating projects over climate change adaptation programs. With regards to investigating if there are progressive achievements in the financing of adaptation programs in the budget, we did not find substantial evidence from the CBT scores and inflation adjusted allocations

to support the assertion of progressive achievements. The changes in yearly budgets to adaptation programs reflects a commitment towards completing ongoing adaptation projects, but does not align with the provisions in the NASPA – CCN policy, which mandates consistent increase in financial resources to accommodate adaptation programs. A highlighted reason for this is the negative effects of crude oil price volatilities in the international market and the Nigeria’s susceptibility to external shocks. Thus, whenever revenue projections are not met, the government prioritizes growth recovery programs over programs associated with mitigating or adapting to climate change shocks. We recommend that during periods of recession or reduced revenues, the government could lean towards international sources of climate change financing rather than depend of domestic revenues.

References

- Adger, W.N. (2006). Vulnerability. *Global Environmental Change*, 16(3), 268–28.
- Afsah, S., Laplante, B., & Wheeler, D. (1996). Controlling Industrial Pollution: a new paradigm. *World Bank policy research working paper*, (1672).
- Ampaire, E. L., Jassogne, L., Providence, H., Acosta, M., Twyman, J., Winowiecki, L., & Van Asten, P. (2017). Institutional challenges to climate change adaptation: A case study on policy action gaps in Uganda. *Environmental Science & Policy*, 75, 81-90.
- Amanchukwu, R. N., Amadi-Ali, T. G., & Ololube, N. P. (2015). Climate change education in Nigeria: The role of curriculum review. *Education*, 5(3), 71-79.
- Ayers, J. (2009). International funding to support urban adaptation to climate change. *Environment and Urbanization*, 21(1), 225-240.
- Barr, R., Fankhauser, S., & Hamilton, K. (2010). Adaptation investments: a resource allocation framework. *Mitigation and Adaptation Strategies for Global Change*, 15(8), 843-858.
- Bouwer, L. M., & Aerts, J. C. (2006). Financing climate change adaptation. *Disasters*, 30(1), 49-63.
- Bowen, A., Cochrane, S., & Fankhauser, S. (2012). Climate change, adaptation and economic growth. *Climatic change*, 113(2), 95-106.
- Brooks, N., Anderson, S., Burton, I., Fisher, S., Rai, N., & Tellam, I. (2013). An operational framework for tracking adaptation and measuring development (TAMD).
- Buckley, D. (2014). Mobilising Adaptation Finance: The status of public finance related to national funding for developing countries”. Presented for the Second Forum of the Standing Committee on Finance 21 June 2014. Available at: https://unfccc.int/sites/default/files/s3_1_daniel_b_scf_adaptation_finance_seminar_undp_dbuckley.pdf

- Burmeister, H., Cochun, A., Hausotter, T., & Stahr, C. (2019, October 21). *Financing adaptation to climate change – an introduction (Adaptation Briefings)*. Retrieved from Adaptation Community: <https://www.adaptationcommunity.net/wp-content/uploads/2019/10/2019-10-adelphi-Adaptation-Briefings-Financing-Adaptation-an-Introduction.pdf>.
- Challinor, A., Wheeler, T., Garforth, C., Craufurd, P., & Kassam, A. (2007). Assessing the vulnerability of food crop systems in Africa to climate change. *Climatic change*, 83(3), 381-399.
- Cooper, P. J. M., Stern, R. D., Noguera, M., & Gathenya, J. M. (2013). Climate change adaptation strategies in Sub-Saharan Africa: foundations for the future. In *Climate change—realities, impacts over ice cap, sea level and risks*.
- CPI (2017). Global Landscape of Climate Finance 2017. Retrieved From: <https://climatepolicyinitiative.org/wpcontent/uploads/2017/10/2017-Global-Landscape-of-Climate-Finance.pdf>
- CPI (2018). Global Climate Finance: An Updated View 2018. Retrieved from: <https://climatepolicyinitiative.org/wp-content/uploads/2018/11/Global-Climate-Finance-AnUpdated-View-2018.pdf>
- CPI (2018a). Understanding and Increasing Finance for Climate Adaptation in Developing Countries. Retrieved From: <https://climatepolicyinitiative.org/wp-content/uploads/2018/12/Understanding-and-IncreasingFinance-for-Climate-Adaptation-in-Developing-Countries-1.pdf>
- De Mesquita, B. B., Morrow, J. D., Siverson, R. M., & Smith, A. (2002). Political institutions, policy choice and the survival of leaders. *British Journal of Political Science*, 559-590.
- Dodman, D., Ayers, J., & Huq, S. (2009). Building Resilience in 2009 State of the World; into a Warming World. *The Worldwatch Institute*.
- Ebele, N. E., & Emodi, N. V. (2016). Climate change and its impact in Nigerian economy. *Journal of Scientific Research and Reports*, 1-13.
- Emodi, N. V., Emodi, C. C., Murthy, G. P., & Emodi, A. S. A. (2017). Energy policy for low carbon development in Nigeria: A LEAP model application. *Renewable and Sustainable Energy Reviews*, 68, 247-261.
- European Bank for Reconstruction and Development. (2014, September). *Joint Report on MDB climate Finance*. Retrieved from <https://www.ebrd.com/downloads/news/mdb-climate-finance-2013.pdf>
- Fashagba, J. Y. (2009). Legislative Oversight under the Nigerian Presidential System. *The Journal of legislative studies*, 15(4), 439-459.
- Fazey, I., Gamarra, J. G., Fischer, J., Reed, M. S., Stringer, L. C., & Christie, M. (2010). Adaptation strategies for reducing vulnerability to future environmental change. *Frontiers in Ecology and the Environment*, 8(8), 414-422.
- Federal Ministry of Environment (2020). *Third National Communication (TNC) of the Federal Republic of Nigeria: United Nations Framework Convention on Climate Change (UNFCCC)*. <https://www4.unfccc.int/sites/SubmissionsStaging/NationalReports/Documents/187563-Nigeria-NC3-1-TNC%20NIGERIA%20-%2018-04-2020%20-%20FINAL.pdf>
- Ford, J. D., Berrang-Ford, L., Biesbroek, R., Araos, M., Austin, S. E., & Lesnikowski, A. (2015). Adaptation tracking for a post-2015 climate agreement. *Nature Climate Change*, 5(11), 967-969.
- Haider, H. (2019). *Climate change in Nigeria: Impacts and responses*. K4D Helpdesk Report 675. Brighton, UK: Institute of Development Studies.
- Ihuah, P. W., & Benebo, A. M. (2014). An assessment of the causes and effects of abandonment of development projects on real property values in Nigeria. *International Journal of Research in Applied, Natural and social sciences*, 2(5), 25-36.
- Le, H., and Baboyan, K. (2015). Climate Budget Tagging County – Driven Initiative in Tracking Climate Change Expenditure: The Case of Bangladesh, Indonesia, Nepal and Philippines. UNDP Working Paper: UNDP.

- Lim, B., Spanger-Siegfried, E., Burton, I., Malone, E., & Huq, S. (2005). Adaptation policy frameworks for climate change: developing strategies, policies and measures. *New York: United Nations Development Programme.*
- Lobell, D. B. (2014). Climate change adaptation in crop production: Beware of illusions. *Global Food Security, 3*(2), 72-76.
- Lobell, D. B., Burke, M. B., Tebaldi, C., Mastrandrea, M. D., Falcon, W. P., & Naylor, R. L. (2008). Prioritizing climate change adaptation needs for food security in 2030. *Science, 319*(5863), 607-610.
- Micale, V., Tonkonogy, B., & Mazza, F. (2018). Understanding and Increasing Finance for Climate Adaptation in Developing Countries. *Climate Policy Initiative.*
- Moser, S. C., & Ekstrom, J. A. (2010). A framework to diagnose barriers to climate change adaptation. *Proceedings of the national academy of sciences, 107*(51), 22026-22031.
- Mukheibir, P., Kuruppu, N., Gero, A., & Herriman, J. (2013). Overcoming cross-scale challenges to climate change adaptation for local government: a focus on Australia. *Climatic Change, 121*(2), 271-283.
- New, M., Liverman, D., Schroder, H., & Anderson, K. (2011). Four degrees and beyond: the potential for a global temperature increase of four degrees and its implications: Introduction. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences, 369*(1934), 6-19.
- NIMET (2008). Nigeria Climate Review Bulletin 2007. Nigerian Meteorological Agency. February 2008. NIMET - No. 001.
- Obani, P. C., & Gupta, J. (2016). The impact of economic recession on climate change: eight trends. *Climate and Development, 8*(3), 211-223.
- ODI (2017). Climate Finance Thematic Briefing: Adaptation Finance. See: <https://www.odi.org/sites/odi.org.uk/files/resource-documents/12073.pdf>.
- OECD, DAC. (2011). Handbook on the OECD-DAC Climate markers. *Paris: Organisation for Economic Co-operation and Development's Development Assistance Committee (DAC).* Available at: <https://www.oecd.org/dac/stats/48785310.pdf>.
- Olorunmola, A. (2016). Cost of politics in Nigeria. *Westminster Foundation for Democracy.*
- Omotola, J. S. (2010). Elections and democratic transition in Nigeria under the Fourth Republic. *African Affairs, 109*(437), 535-553.
- Organization for Economic Cooperation and Development. (2011, September). *Handbook on the OECD - DAC Climate Markers.* Retrieved from <https://www.oecd.org/dac/stats/48785310.pdf>
- Resch, E., Allan, S., Álvarez, L. G., & Bisht, H. (2017). Mainstreaming, accessing and institutionalising finance for climate change adaptation. *ACT Learning Paper. Oxford: OPM.*
- Rogger, D. (2014). The causes and consequences of political interference in bureaucratic decision making: Evidence from Nigeria. *Job Market Paper, 12*(1), 1-22.
- Schuftan, C. (2005). Dignity Counts: A guide to using budget analysis to advance human rights. *Social Change, 35*(1), 143-146.
- Smit, B., & Skinner, M. W. (2002). Adaptation options in agriculture to climate change: a typology. *Mitigation and adaptation strategies for global change, 7*(1), 85-114.
- Stafford, M. S., Horrocks, L., Harvey, A., & Hamilton, C. (2011). Rethinking adaptation for a 4° C world. *Philosophical transactions. Series A, Mathematical, physical, and engineering sciences, 369*(1934), 196-216.
- Thorarinsdottir, T. L., and K. de Bruin (2016), Challenges of climate change adaptation, *Eos, 97*, <https://doi.org/10.1029/2016EO062121>. Published on 07 November 2016,
- UNDP. (2015). Climate Budget Tagging Country-driven initiative in tracking climate expenditure - The Case Studies of: Bangladesh, Indonesia, Nepal and the Philippines." Available at:

- https://www.climatefinancedevelopmenteffectiveness.org/sites/default/files/event/CFSD_forum2015/climate/Climate%20Budget%20Tagging%20_July%202015_DRAFT.pdf.
- UNDP. (2016a). “Charting New Territory: A stock take of climate change finance frameworks in Asia-Pacific. Retrieved From: [https://www.climatefinance-developmenteffectiveness.org/sites/default/files/documents/09_06_16/Charting%20New%20Territory%20A%20Stocktake%20of%20Climate%20Change%20Financing%20Fra](https://www.climatefinance-developmenteffectiveness.org/sites/default/files/documents/09_06_16/Charting%20New%20Territory%20A%20Stocktake%20of%20Climate%20Change%20Financing%20Frameworks%20in%20Asia%20Pacific.pdf)
- UNDP. (2016b). the Adaptation Finance Gap Report. Retrieved from https://orbit.dtu.dk/ws/files/177810752/50313_UNEP_GAP_report_2016_v5_SB.pdf.
- UNDP. 2012. “Climate Public Expenditure and Institutional Reviews (CPEIRs) in the Asia-Pacific Region - What have We Learnt?” s.l.: UNDP, 2012. Available at: http://www.asia-pacific.undp.org/content/dam/rbap/docs/Research%20&%20Publications/democratic_governance/APRC-DG-2012-CPEIRLessonsLearnt.pdf.
- UNFCCC. (2018). UNFCCC Standing Committee on Finance 2018 Biennial Assessment and Overview of Climate Finance Flows. Retrieved from: <https://unfccc.int/sites/default/files/resource/2018%20BA%20Technical%20Report%20Final.pdf>.
- UNFPA. (2009). *Financing that Makes a Difference*. Retrieved from https://www.unfpa.org/sites/default/files/pub-pdf/climateconnections_5_finance.pdf
- Urwin, K., & Jordan, A. (2008). Does public policy support or undermine climate change adaptation? Exploring policy interplay across different scales of governance. *Global environmental change*, 18(1), 180-191.
- Vogel, B., & Henstra, D. (2015). Studying local climate adaptation: A heuristic research framework for comparative policy analysis. *Global Environmental Change*, 31, 110-120.
- Williams, M. J. (2017). The political economy of unfinished development projects: Corruption, clientelism, or collective choice?. *American Political Science Review*, 111(4), 705-723.
- World Bank (2010a), World Development Report 2010. Development and Climate Change. World Bank, Washington DC.
- Ziervogel, G., Johnston, P., Matthew, M., & Mukheibir, P. (2010). Using climate information for supporting climate change adaptation in water resource management in South Africa. *Climatic Change*, 103(3-4), 537-554.

