ANALYSIS OF ADAPTATION COMPONENTS OF AFRICA'S NATIONALLY DETERMINED CONTRIBUTIONS (NDCS)

African Development Bank

AFRICAN DEVELOPMENT BANK GROUP

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This report was commissioned by the Africa NDC Hub Secretariat hosted by the African Development Bank (AfDB). The development of the report was coordinated by Davinah Milenge Uwella with reviews from James Kinyangi, Al Hamdou Dorsouma and Gareth Phillips under the overall guidance of Anthony Nyong.

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Cover Photo: Aerial View of the Okavango Delta, Botswana, South-Western Africa. by Terri Lea Mays

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Electricity pylon with the early morning light gleaming off the cables in South Africa.
Photo: Charles HB Mercer

Twilight power lines.
Photo: Nikiko

EXECUTIVE SUMMARY

Adaptation and mitigation are increasingly recognised by the United Nations Framework Convention on Climate Change (UNFCCC) as being of critical importance in the global response to climate change (Lesnikowski, et al., 2017; Okereke and Coventry, 2016). However, there have been questions about whether, and the extent to which, adaptation actions can be considered part of Nationally Determined Contributions (NDCs). Most African governments believe that climate adaptation should be an important part of the design and delivery of NDCs, suggesting that such an approach is necessary to increase their understanding of climate risks, improve the effectiveness of climate actions, and increase accountability under the UNFCCC. Currently, 50 countries have submitted their NDCs with all of them including adaptation actions and requirements. This is a remarkable accomplishment and a strong demonstration of Africa's engagement with the international climate treaty.

However, despite the laudable efforts to integrate adaptation into NDCs and wider national economic development plans, there remain concerns that the adaptation components of African governments' NDCs lack rigour in terms of clear identification of vulnerabilities, priority sectors, actions so far undertaken, support required, costing, and financial gaps. This represents a major gap for policy development, resource mobilisation, and financing of adaptation components in Africa.

In an attempt to help fill this gap, this report provides a systematic categorisation of the adaptation components of Africa's NDCs. The report provides information on the prevailing vulnerabilities, priority sectors, costs, financing options, and timeframes as presented in Africa's NDCs.

Furthermore, it delves into mainstreaming, implementation plans, capacity and technology needs. The goal is to show the need, and provide guidance, for a robust and more systematic approach to the treatment and presentation of adaptation components in the future.

The results of the analysis could be used to develop a comprehensive financing strategy drawing on the diversity of financial instruments and sources identified in the NDCs, including domestic, international, private, and public sources. It could also provide an important input to the global stocktake of Africa's collective progress on adaptation. This could in turn help to support learning and increase accountability among countries.

The goal is to show the need, and provide guidance for a robust and more systematic approach to the treatment and presentation of adaptation components in the future.

KEY FINDINGS

- A strong commitment to adaptation is noted in all 48 of Africa's NDCs analysed[1].

- Majority of Africa's NDCs identify current, short-term, and long-range adaptation needs, priorities, goals, and measures. These goals and priorities provide a strong basis for targeted resource mobilisation efforts and designing immediate and future adaptation interventions. However, all countries stress the need for increased knowledge and sharing of information at the country and regional level as a critical component for climate adaptation in Africa and an area where significant funding needs to be directed.

- A vast proportion of African NDCs state their adaptation goals solely in qualitative, descriptive terms and fail to include concrete number of, for example, projects to be completed, target number of beneficiaries, or amount of money sought. This is a concern from a resource mobilisation perspective because the availability of concrete figures can help to communicate action and need which in turn can help galvanise efforts to mobilise climate finance. Such goals also make it easier to track progress which is very important from a monitoring and reporting perspective.

- The total cost of adaptation for Africa (derived from figures provided by 28 NDCs) is US$7.4 billion a year by 2020. This is the same order of magnitude as the projection made by the UNEP Adaptation Gap Report (US$7 to 15 billion).

- African governments expect that thirty-six percent (US$ 2.7 billion) of the total annual cost projected for adaptation by 2020 will come from domestic sources, while 64% (US$ 4.7 billion) will come from international sources. This is based on figures provided in nine NDCs

- On a regional basis, Western Africa proposes the highest cost (estimated at US$2.1 billion every year), and Northern Africa the lowest (estimated at US$962.9 million per year by 2020).

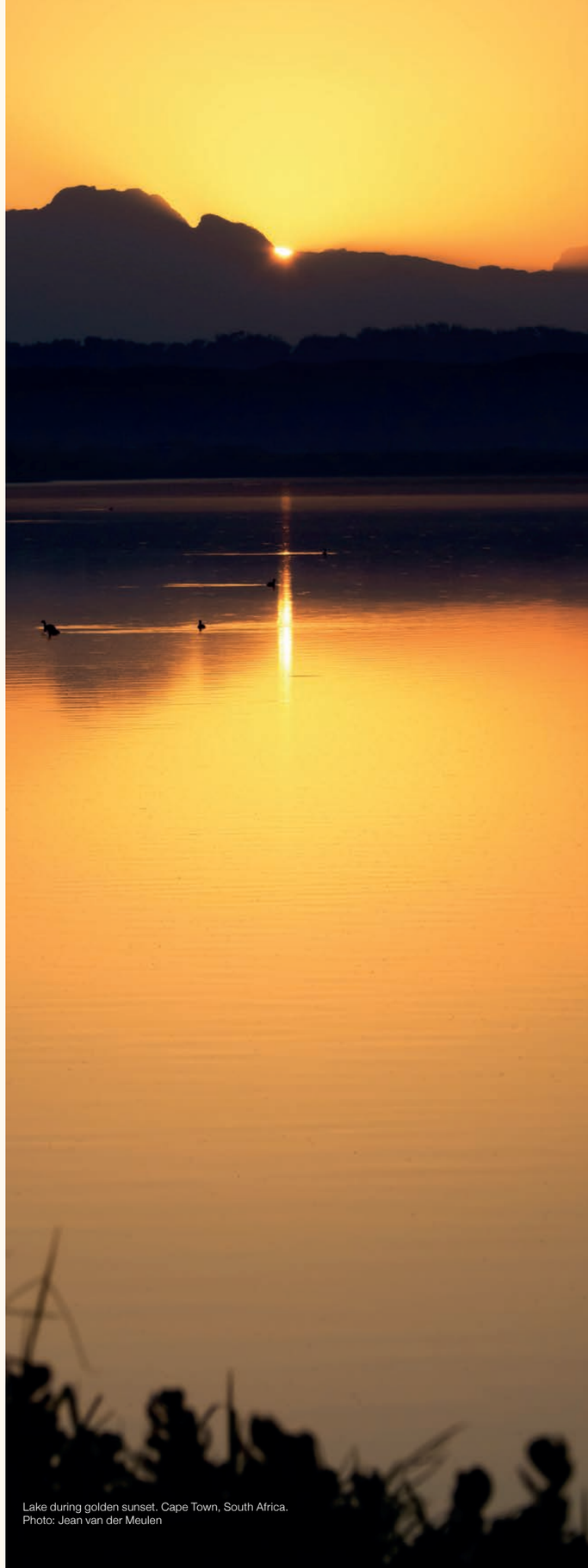
- The average annual projected cost for adaptation in the five topmost priority sectors until 2020 are as follows: US$0.4 billion for agriculture, US$0.3 billion for water, US$0.2 billion for health, US$0.2 billion for energy, and US$0.2 billion for biodiversity and ecosystems. The average annual cost of adaptation in these priority sectors will need to increase by six to ten times by 2030 and twelve to twenty-two times by 2050 to fill existing gaps.

- African NDCs lack clarity in terms of the quantification of costs; some have not quantified costs while some do not distinguish costs for mitigation and adaptation. Most NDCs are vague in terms of the current and projected distribution of specific sources of finance. For instance, while 13% of NDCs refer to domestic resources as a source of support for adaptation in their countries, they do not specify whether these resources will come from private or public sources.

- All African countries recognise the close relationship between adaptation and mitigation and stress that some adaptation options such as agriculture, forestry and land use can mitigate emissions. Conversely, there can be trade-offs between adaptation and mitigation, such as when bioenergy or reforestation encroach on land needed for agricultural adaptation and food security.

- Africa's NDCs stress that adaptation options that reduce the climate vulnerabilities in sectors such as agriculture, health and urban and ecological systems have many synergies with sustainable development. At the same time, lack of or poorly designed adaptation could result in trade-offs with adverse impacts for sustainable development. Hence, adaptation for Africa cannot be seen simply as localized community-based actions to reduce climate vulnerabilities but is rather linked with the broader goal of national sustainable economic development of Africa.

- Vulnerable and priority adaptation sectors vary across African countries as follows: water (mentioned by 43 countries), agriculture (42), disaster risk reduction (35), health (32), biodiversity and ecosystems (31), and human settlement and land management (33).



Lake during golden sunset. Cape Town, South Africa.
Photo: Jean van der Meulen

[1] The report covers the adaptation components of 48 NDCs, because at the time of writing, only 48 African countries had ratified the agreement by submitting their NDCs.
[2] 2017 Joint Report on Multilateral Development Banks' Climate Finance

RECOMMENDATIONS

The following policy recommendations can be drawn from the report findings

- There is an urgent need for a strong resource mobilisation drive by individual African countries, the AfDB and international development partners to close the significant gap in adaptation funding and investment in Africa.
- There is a huge scope for private sector investment in climate adaptation in Africa in areas such as flood defences, irrigation, and climate insurance. Results-based finance models suggest that motivating private sector investment in adaptation (for example, by using the Adaptation Benefit Mechanism (ABM) could allow countries to mobilise additional support to implement their NDCs. Based on the analysis done in Chapter 3, ABM could best be implemented across Africa in the agriculture and water sectors, which are also highlighted as top priorities for adaptation in African NDCs.
- It is vital that private sector led incentives are carefully designed to focus less on short-term profit maximisation and more on facilitating long-term climate resilience and economic prosperity for communities and countries.
- African governments, alongside their international partners, will need to work harder to revise their NDCs in order to provide clearer costing of adaptation measures and current spend on adaptation, as well as financing gaps and opportunities. Effort should also be devoted to translating loosely stated adaptation needs in the NDCs into concrete near-term and long-range plans and bankable projects. There is scope for a continental actor, such as the African Development Bank (AfDB), to invest in the development of a template that African countries can use in the future to standardise reporting, methodology, timeframes, investments and financial gaps so as to increase transparency and data comparability.
- African countries need to be far clearer in categorising and communicating their domestic spend on adaptation in their national budgets. It is likely that such steps will enhance both domestic and international climate adaptation resource mobilisation efforts.
- Measures to identify Africa's domestic spend on adaptation will be most useful ahead of the global stocktake, in order to show the collective progress Africa is making on adaptation. This could help support and increase accountability among parties.
- It is vital that climate adaptation policies and strategies are carefully designed to link adaptation, mitigation and sustainable development goals. Poorly designed adaptation measures could result in significant trade-offs with adverse impacts for sustainable development. It is especially important that national institutions such as ministries and agencies, intended to deal with climate adaptation, are designed to increase synergies between sectors and reduce unnecessary overlaps.
- Since lack of capacity and institutions remains a critical hindrance to effective adaptation planning in Africa, there is a need for international and continental development partners (including AfDB) to invest in building human and institutional capacity to enable countries design and implement climate adaptation action.
- African governments need to work hard individually and collectively on policies aimed at generating and sharing high quality data and information that can aid more effective climate adaptation in their jurisdictions. At the same time, data generation and sharing initiatives and portals constitute a very important investment area for continental institutions such as the Bank and the African Union, perhaps working through the newly created Africa Adaptation Initiative (AAI).
- There is a need for a coordinated effort and mechanism at the continental and regional level to enhance systematic transfer and diffusion of climate adaptation knowledge and technologies in Africa. Such an effort could target technologies and processes in the five priority areas – water (e.g. rain water harvesting techniques); agriculture (e.g. low-cost irrigation techniques); and disaster risk reduction (e.g. early warning systems).

ABBREVIATIONS

AAI	Africa Adaptation Initiative
ABM	Adaptation Benefit Mechanism
AfDB	African Development Bank Group
AGN	African Group of Negotiators
AMCEN	African Ministerial Conference on the Environment
CAHOSCC	Committee of African Heads of State on Climate Change
CI	Climate Initiative
CIS	Climate Information Services
COP	Conference of Parties
CSA	Climate Smart Agriculture
DRM	Disaster Risk Management
DRR	Disaster Risk Reduction
GCF	Green Climate Fund
GDP	Gross Domestic Product
GIS	Geographic Information Systems
INDC	Intended Nationally Determined Contributions
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Country
MER	Monitoring, Evaluation, and Reporting
MRV	Monitoring, Reporting, and Verification
NDC	Nationally Determined Contributions
ODA	Overseas Development Assistance
PA	Paris Agreement
PPCR	Pilot for Climate Change Resilience
SDG	Sustainable Development Goals
UNFCCC	United Nations Framework Convention on Climate Change

Cliffs at Bo-Karoo, South Africa.
Photo: Frans Van Heerden

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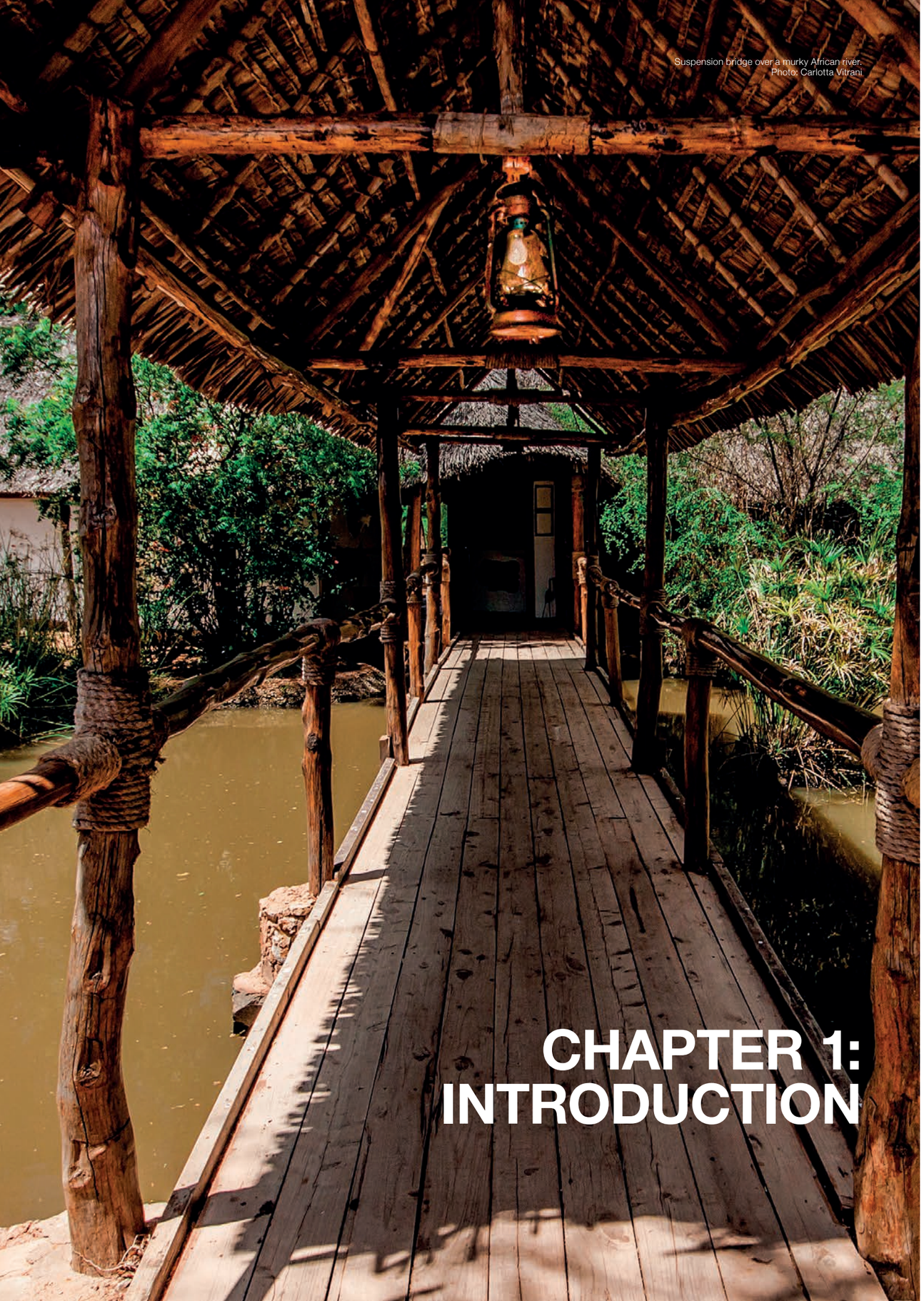


Suspension bridge over a murky African river.
Photo: Carlotta Vitrani

CHAPTER 1: INTRODUCTION

1.1 CONTEXT AND PURPOSE

Given the low contribution and high vulnerability of African countries to climate change, African governments have consistently stressed that adaptation is a central component of their climate response measure. The Committee of African Heads of State on Climate Change (CAHOSCC), the African Ministerial Conference on the Environment (AMCEN) and the African Group of Negotiators (AGN) have all made increasing the scale of adaptation action (anchored around a global adaptation goal and including increased funding) a key ask in their position papers to the Paris Conference of Parties (COP). Critically, to ensure the realisation of this ambition, they launched an ambitious African Adaptation Initiative (AAI) designed to explore how best to scale up adaptation action in Africa in the context of NDCs.

As of January 2019, 53 African countries (excluding Libya) have submitted their INDCs (Intended Nationally Determined Contributions). These INDCs become NDCs when a country submits an instrument for ratification, acceptance, approval, or accession to the Paris Agreement (PA). At the time of the analysis, 48 African countries had ratified the PA by submitting NDCs (see Table 1). NDCs are revised every five years with an expectation of changes or increases to ambitions for the different contributions specified.

Table 1: Countries that have submitted NDCs (source: UNFCCC NDC registry)

No	Country	Date of submission
1	Algeria	20 October 2016
2	Benin	11 October 2017
3	Botswana	11 November 2016
4	Burkina Faso	11 November 2016
5	Burundi	17 January 2018
6	Cape Verde	21 September 2017
7	Cameroon	29 July 2016
8	CAR	11 October 2016
9	Chad	12 January 2017
10	Comoros	23 November 2016
11	Congo	21 April 2017
12	Côte D'Ivoire	25 October 2016
13	DRC	13 December 2017
14	Djibouti	11 November 2017
15	Egypt	29 June 2017
16	Eritrea	19 June 2018
17	Eswatini	21 September 2016
18	Ethiopia	09 March 2017
19	Gabon	02 November 2016
20	Gambia	07 November 2016
21	Ghana	21 September 2016
22	Guinea	21 September 2016
23	Kenya	28 December 2016
24	Lesotho	22 June 2018

No	Country	Date of submission
25	Liberia	27 August 2018
26	Madagascar	21 September 2016
27	Malawi	29 June 2017
28	Mali	23 September 2016
29	Mauritania	27 February 2017
30	Mauritius	22 April 2016
31	Morocco	19 September 2016
32	Mozambique	04 June 2016
33	Namibia	21 September 2016
34	Niger	21 September 2016
35	Nigeria	16 May 2017
36	Rwanda	06 October 2016
37	Sao Tome and Principe	02 November 2016
38	Seychelles	29 April 2016
39	Sierra Leone	01 November 2016
40	Somalia	22 April 2016
41	South Africa	01 November 2016
42	Sudan	02 August 2017
43	Tanzania	18 May 2018
44	Togo	28 June 2017
45	Tunisia	10 February 2017
46	Uganda	21 September 2016
47	Zambia	09 December 2016
48	Zimbabwe	07 August 2017

Adaptation and mitigation are increasingly recognised by the United Nations Framework Convention on Climate Change (UNFCCC) as being of critical importance in the global response to climate change (Lesnikowski, et al., 2017; Okereke and Coventry, 2016). However, there have been questions about whether, and the extent to which, adaptation actions can be considered part of the NDCs.

Most African governments believe that climate adaptation should be an important part of the design and delivery of Nationally Determined Contributions (NDCs). They assert that the inclusion of adaptation actions in NDCs enables parties to increase their understanding of climate risks, improve the effectiveness of climate actions, and increase accountability under the UNFCCC. Documenting adaptation actions as part of NDCs is also seen as valuable with regards to enhancing the understanding of the financial and nonfinancial cost of adaptation as well as options for mobilising or scaling-up resources for adaptation both within and outside the context of the UNFCCC.

However, a snap review of African governments' NDCs shows stunning variations in adaptation priorities in terms of style, length, depth, method, and scope; and variations in key adaptation sections in terms of structure and quality of content. Limited experience with adaptation costing and |programming in NDCs across countries in Africa is also apparent as one looks at NDCs. These variations, along with a lack of rigour and depth, represent a significant gap for policy development, resource mobilisation, and financing of adaptation components in African NDCs.

This report examines the state of adaptation in |African NDCs with a view to informing policy development and especially the mobilisation of resources to support the design and implementation of adaptation programmes across Africa. The goal is to highlight the need, and provide guidance, for a robust and more systematic approach to the treatment and presentation of adaptation components in the future, including cost projections, sectoral priorities, support required, governance institutions, financing options and links with national economic development plans. The analysis is intended to guide the Africa NDC Support Hub and its partners to better support the improvement of future adaptation planning and implementation in the continent with particular emphasis on the Least Developed Countries (LDCs).

In a global sense, this analysis is an essential input to the stocktake on the collective progress Africa is making on adaptation, which could help support learning and increase accountability among parties. It also provides a baseline reference for countries seeking to revise their NDC adaptation targets or raise their overall ambitions by 2020. This report, therefore, represents a crucial step to engage governments and move national climate financing processes to the path of achieving Africa's NDCs.

Cultivated agricultural farm land. Nandi Hills, Kenya, Africa.
Photo: Jen Watson

1.2 Focus and methodology

The report is a detailed analysis of:

1. The scope of adaptation components of African governments' NDCs: This entails a description of how adaptation is presented or treated in African NDCs. It includes adaptation vulnerabilities and priority sectors, goals, targets, and cross-sectoral measures for adaptation, including research and education, information and early warning systems, and disaster risk reduction.
2. The financial cost of adaptation in African NDCs: This involves quantification of total costs for adaptation, a cost estimate for priority sectors, calculations of current spend and investment needs and gaps, and a description of the sources of adaptation finance.
3. Non-financial costs of adaptation: This involves the requirements for the implementation of adaptation plans such as capacity and technology which are not expressed in financial figures.
4. Options and strategies for adaptation mainstreaming into wider national economic development plans. These include the processes through which countries monitor, evaluate and learn from adaptation experiences.

To address the above-listed objectives, all NDCs submitted by African countries (48 at the time of this report) were analysed, with a focus on the adaptation sections. The analysis comprised reading and manually grouping adaptation themes under the broad categories specified above.

Themes (for example the cost of, and investment gap in, adaptation financing) were then analysed in the context of the broader literature to show any relationship to previous assessments. In addition, 17 senior experts from 11 African countries who were involved in the preparation of their countries' NDCs and other adaptation plans (NAP and NAPA) were interviewed. Each interview lasted between 30 and 45 minutes and the insights gleaned were used to supplement the documentary analysis described above.

In addition, the report presents case analyses focusing on six countries (Cameroon, Ghana, Morocco, Sierra Leone, South Africa, and Tanzania). The case study countries were selected purposively on the basis of their vulnerability and adaptation to climate change, quality of their NDCs, and progress made with implementation including mobilising finance from domestic and international sources.

1.3 Organisation of the report

The report is organised into seven chapters as follows:

Chapter 01 — **The current chapter - provides a context for the research, as well as an overview of data collection, analysis, and integration methods and procedures used;**

Chapter 02 — **Provides a brief description of the evolution of NDCs and then goes on to discuss the place of adaptation in the NDCs in the context of the Paris Agreement;**

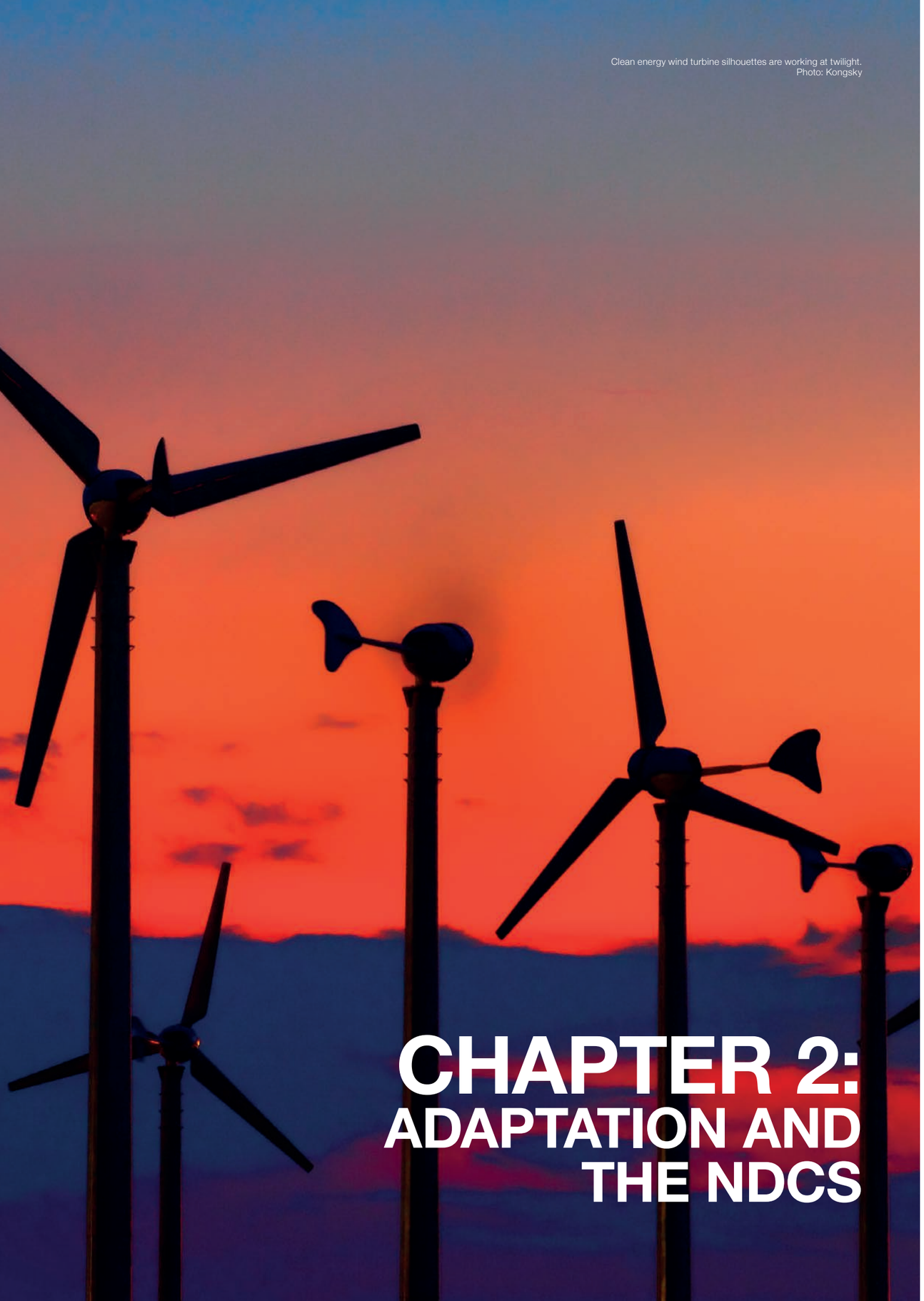
Chapter 03 — **Is the start of the empirical analysis of data on adaptation components of African NDCs. It begins with a broad categorisation of adaptation contributions, and then goes on to provide analyses of adaptation goals, targets, sectors, subsectors, and cross-sectoral measures covered by African NDCs;**

Chapter 04 — **Builds on the previous empirical chapter to present the financial aspects of adaptation commitments in African NDCs, including current and projected financing requirements, key sources of finance, targeted sectors and subsectors, quantification methodology and sources of support;**

Chapter 05 — **Analyses the non-financial components of adaptation commitments, focusing on the adaptation process and means of implementation - finance, technology transfer, and capacity building;**

Chapter 06 — **Presents real case analyses of the scope of adaptation commitments, as well as financial and non-financial components in the NDCs of six African countries;**

Chapter 07 — **The final chapter - summarises key findings and provides a set of recommendations to address key challenges identified in the analysis.**



Clean energy wind turbine silhouettes are working at twilight.
Photo: Kongsky

CHAPTER 2: ADAPTATION AND THE NDCS

2.1 ADAPTATION AND THE NDCS

The Paris Agreement (PA) negotiated in 2015 marked a critical turn in global climate cooperation. In the preceding Kyoto Protocol, developing countries had been excluded from binding obligations to reduce emissions. The PA, by contrast, commits all countries, including poor, developing nations, to take on internally verified commitments for climate action. The main instrument agreed under the PA through which countries will articulate and communicate their climate action is the Nationally Determined Contributions (NDC).

The NDC is viewed as a breakthrough and an innovative tool because it provides the framework to integrate bottom-up, self-motivated voluntary commitments of states with a set of legally binding provisions for monitoring and ratcheting-up ambition under the international climate agreement. NDCs also allow countries to set targets and milestones while assessing and improving their climate actions over time. The PA requires ratification by at least 55 countries (representing about 55% of global emissions) before it enters into force[3]. This threshold was crossed in early October 2016 to begin the implementation of the agreement in November 2016[4].

A fundamental point of disagreement in the run-up to the PA related to whether or not adaptation should be included in the NDCs (see Table 2 below).

Table 2: Arguments for and against including adaptation in NDCs in the run-up to the Paris Agreement

Arguments against including adaptation in the NDC	Arguments for including adaptation in the NDC
Adaptation had already received sufficient attention through previous COPs such as the Bali Accord.	Global goals on adaptation will help to place adaptation on a par with mitigation, in line with the previous commitments and provisions of the international climate agreement.
Too much focus on adaptation could detract attention from reducing greenhouse gas emissions.	There is a synergy between adaptation and mitigation. Some adaptation options, for example in agriculture, forestry and land, can mitigate emissions.
Most adaptation measures could not be systematically measured or quantified.	Adaptation action in NDCs is an essential basis for encouraging countries to assess vulnerabilities, identify adaptation options and work towards the identification of common metrics.
Adaptation is more of a local than a global issue.	Adaptation is no more or less a local issue than mitigation. Cumulative global emission is simply an aggregate of localised emissions.
The emphasis in adaptation should be on refining, scaling up, and implementing existing adaptation instruments such as NAPs and NAPAs.	Including adaptation in NDCs will encourage poor countries to showcase their efforts and needs as well as helping recognise national efforts towards the global goal.
Adaptation is already being covered in several other international agreements like the Hyogo Framework for Action.	Giving adaptation a pride of place in NDCs will help to systematically identify and address the gap in the implementation of adaptation and the relevant support needed by poor countries.

3 Northrop, E. and Ross, K., 2016. After COP21: what needs to happen for the Paris Agreement to take effect? Geominas, 44(70), pp.133-137.
4 Rogelj, J., Den Elzen, M., Höhne, N., Fransen, T., Fekete, H., Winkler, H., Schaeffer, R., Sha, F., Riahi, K. and Meinshausen, M., 2016. Paris Agreement climate proposals need a boost to keep warming well below 2 C. Nature, 534(7609), p.631.

In the early stages of the PA's evolution, NDCs were seen exclusively as a tool for documenting mitigation actions. The idea was that anything to be included in the legally binding PA should be subject to official standards for Monitoring, Reporting, and Verification (MRV) to ensure that there are no loopholes and that each country is working towards meeting its commitments. However, African countries generally, were adamant that the PA should include a clear global goal on adaptation, with adaptation actions taken by countries to be presented as part of the measures communicated for adaptation through their NDCs.

Essentially, the African position highlighted the intimate link between mitigation and adaptation, and, in particular, that delayed or failed mitigation leads to the need for more adaptation. A further implication is that a lack of, or poorly designed, adaptation could result in trade-offs with adverse impacts for sustainable development. Similarly, increasing investment in physical and social infrastructure can enhance the resilience and adaptive capacities of communities and countries.

In the end, it became clear that allowing the inclusion of adaptation actions in the NDCs of developing countries might constitute an essential way to encourage these countries to assess vulnerabilities, identify adaptation options, and work towards the identification of common metrics. It was also recognised that including adaptation in NDCs could encourage developing countries to showcase their efforts at addressing climate change risks and impacts, as well as demonstrating what they would need in order to meet their commitments towards the global goal.

The PA explicitly encourages parties to evaluate and provide information on national strategies and measures for addressing climate change but leaves the inclusion of adaptation components to the discretion of parties. To date, there remains some argument about whether or not the PA encourages the presentation of adaptation as a component of NDCs. African governments and technocrats stress that several sections of the PA text reflect calls to give adaptation a place in NDCs, with the general understanding that such actions would help countries to systematically identify and address the gaps in the implementation of adaptation actions.

Some examples include Article 4.7, which recognises a role for adaptation in delivering mitigation co-benefits; Article 7, which is dedicated to adaptation (recognising it as a challenge for all parties); and Articles 2.3, 4.7, and 6.8, which seem to leave countries with the discretion to include adaptation in their NDCs.

Following the submission of NDCs, many African countries have sought to strengthen their efforts to deliver national and regional signature solutions for adaptation through a series of policy decisions and work programmes. One such step has been to establish or strengthen institutions and mechanisms geared primarily toward providing support for adaptation at multiple governance levels. The Africa Adaptation Initiative (AAI) and the Africa NDC Hub are examples of efforts by countries and bilateral and multilateral agencies to further delineate their roles and distinguish their support for adaptation at scale.

Following the submission of NDCs, many African countries have sought to strengthen their efforts to deliver national and regional adaptation action

2.2 Support for adaptation as a component of NDCs

The PA does not link provision of international financial and non-financial support for adaptation to whether or not countries choose to undertake and communicate their adaptation action as part of their NDCs. The provisions that do link adaptation action and finance in the PA seem to lack clarity and ambition.

From a resource mobilisation perspective, there are at least four issues worthy of note:

- Firstly, although financial and non-financial support are clearly essential to the achievement of adaptation targets, the PA stresses that more financial support will come with more ambitious mitigation (not adaptation) actions (Art. 4.5).
- Secondly, the language of the PA text neither provides concrete figures for climate finance nor a timetable for disbursement.
- Thirdly, the PA focuses on procedural aspects of adaptation planning and does not mandate concrete areas of action or provide quantifiable commitments of support for developing countries (see Streck et al. 2016).
- Fourthly, there seems to be less emphasis on international finance to support adaptation actions than in the original UNFCCC text. Rather, the PA tends to stress the significant role domestic budgets could play (Art. 9.3).

Orange sunset in cloudy sky over desert.
Photo: mycola

The vagueness and lack of ambition regarding international finance for adaptation in the PA suggests that despite the insertion of a global goal in the PA, adaptation finance is unlikely to overtake mitigation as a priority for international development partners. The implication is that Africa and other developing countries may have to increasingly rely on domestic and private sources to undertake adaptation actions.

Meanwhile, there are suggestions that African countries already spend vast sums of money on climate adaptation as part of their national budgets and development activities (ODI, 2014). However, there is plenty of ambiguity regarding what counts and does not count as climate finance in national budgets and development plans, which makes it hard to quantify current spend, let alone changes in the financial commitments that countries make over time (Pachauri et al. 2014; Watkiss 2015).

African countries have long decried the lack of available climate finance as well as the limited access to the resources on offer. For instance, while climate finance flowing to Africa has grown over the years, with some sources estimating that US$2.3 billion has been approved for 453 projects and programmes throughout Sub-Saharan Africa since 2003, the disbursements are grossly inadequate when compared to the US$7-15 billion needed annually for adaptation until 2020 (Schaeffer et al. 2014).

Furthermore, authors such as Ruhweza (2015) suggest that at 45%, the percentage of finance going to adaptation in Africa is still much lower compared to the size that is going to mitigation. It is apparent that countries in Africa, like many others across the world, have not received the support they need to implement much needed adaptation programs.

Strategic, targeted and concerted resource mobilisation efforts are needed in order to scale-up climate finance by African governments and their continental institutions. This need is even more urgent given that according to the IPCC Special Report on 1.5 (IPCC, 2018), even in the unlikely event that all the stated emission reduction pledges in the NDCs are implemented, global GHG emissions will still be around between 52-58 GtCO2eq/yr, by 2030, which would result in significant climate impacts and adaptation challenges, especially for Africa.

While resource mobilisation for climate adaptation in Africa will always be challenging, it stands to reason that quantification of costs, and systematic presentation of needs and goals in NDCs, can help to provide more clarity and effective framing of adaptation in the NDCs of developing countries. This will also be likely to increase the precision of requests and enhance transparency and accountability.

Parties recognised the close link between mitigation and adaptation and call for a transparent documentation and communication of the adaptation efforts of states.

2.3 Quality of NDCs and scaling-up finance for adaptation in Africa

It is worth emphasising that the challenges associated with the availability of climate finance, and how climate finance is defined, will be exacerbated if the adaptation components in African NDCs lack rigour in terms of costing, methodology, financing options and implications for national sustainable development.

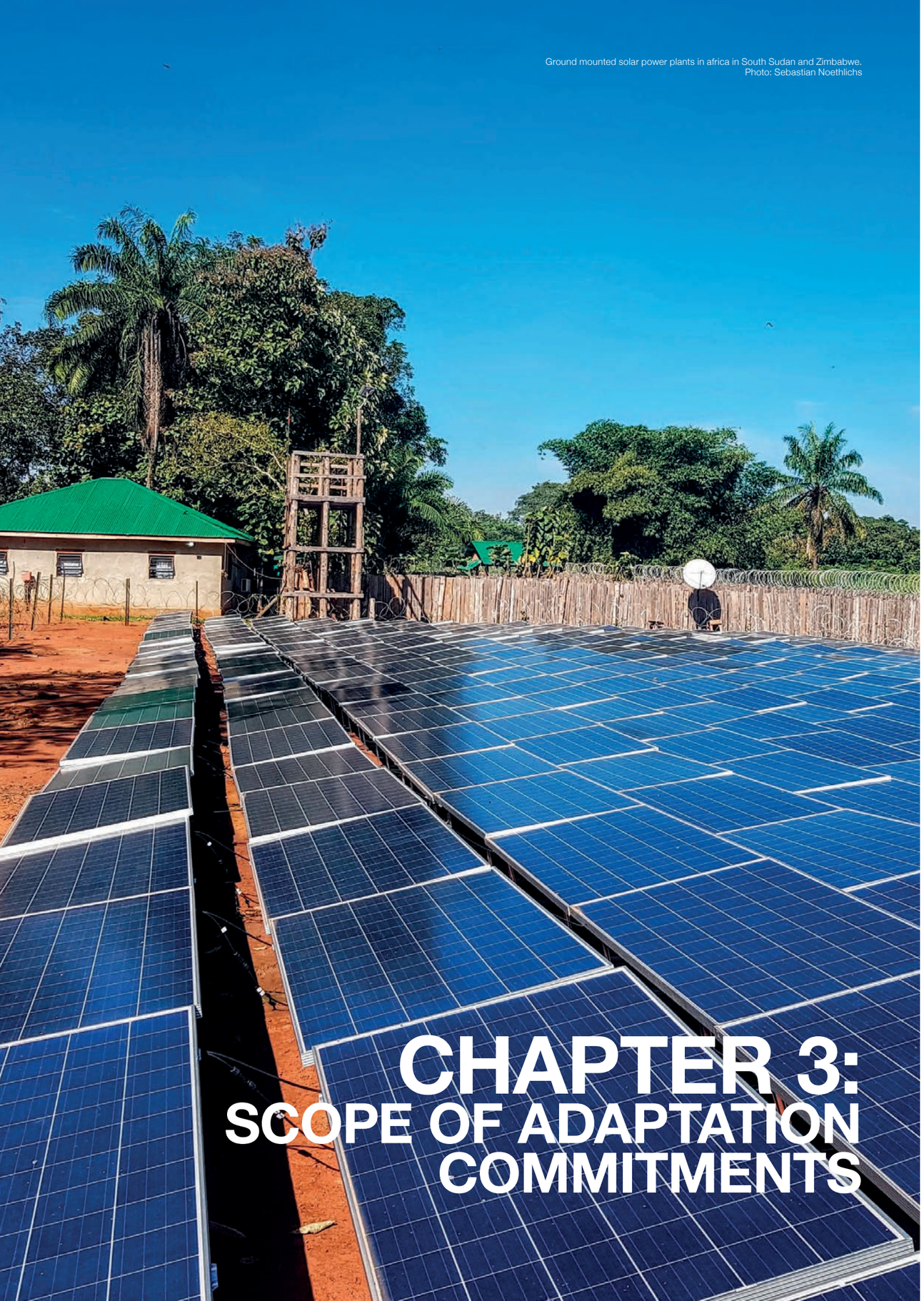
The clear presentation of adaptation components with their cost implications, as well as indications of their relevance to sustainable development, would yield a better understanding of the impact of climate change on various sectors in Africa. Rigorous presentation and analysis would also facilitate the mobilisation of finance, tracking of action, and understanding of the multiple dimensions of interaction between adaptation, mitigation, and sustainable development in African countries. A big part of the problem is, of course, the absence of an 'off-the-shelf' methodology to assess adaptation costs.

Reports on adaptation finance variously provide information on potential adaptation costs by 2020, 2030, 2050, and to the end of the century, relying on integrated economic and climate assessment models like the AD-RICE IAM. However, while authors generally agree on short-term costs, it is much harder to estimate longer-term costs given the divergences of assumptions underlying the various models. One reason for this is that the level of mitigation undertaken now and in the next decades will obviously also be significant in determining costs.

To be clear, the difficulties in measuring and quantifying adaptation are not peculiar to Africa. It is instructive that with a few exceptions (e.g., Weischer et al. 2016), the bulk of the reviews of NDCs immediately before and after Paris, including a recent review done by the Asian Development Bank (ADB), concentrate on mitigation while avoiding adaptation. Others provide a general review of costs for adaptation in developing countries (e.g., Puig et al. 2016; Nakhooda et al. 2011; World Bank 2010) with a specific focus on sectors (e.g., UNFCCC 2007; Parry et al. 2009). Those that analyse African NDCs have limited their work to specific sectors and regions (e.g., UNFAO 2017 for agriculture, forestry and fisheries in Eastern Africa).

These gaps highlight the need for a comprehensive analysis of the adaptation components of African NDCs and associated costs. Understanding the cost implications of adaptation in any given NDC, including what is currently being spent and the sources of such funds, as well as the non-financial cost, will highlight opportunities for international support and open up the debate about where efforts should be focused to mobilise more support to scale-up adaptation and achieve sustainable development in Africa.

Growing sprout bursting through the soil.
Photo: Paladin12



Ground mounted solar power plants in africa in South Sudan and Zimbabwe.
Photo: Sebastian Noethlichs

CHAPTER 3: SCOPE OF ADAPTATION COMMITMENTS

3.1 INTRODUCTION

Analysing the scope of adaptation commitments helps us understand that the adaptation components of African NDCs are not only multi-dimensional, encompassing various impacts, sectors, actions, and governance levels, but are also closely linked to national and regional development processes. While a common African definition of adaptation is neither possible nor desirable given the diversity of contexts, an analysis of the nature of goals and targets, vulnerable sectors and priority measures for adaptation in NDCs can give an indication of how African countries view adaptation, and can also show the areas of pressing need, which in turn can facilitate the mobilisation of finance and efficient allocation of resources.

A strong commitment to adaptation is noted in all 48 African NDCs analysed. African countries highlight current, short-term, and long-range adaptation needs and priorities in their NDCs, which provide a first step toward identifying goals and targets at the sectoral and national levels. Understanding countries' targets and goals is also an important requirement for mobilising finance and designing effective interventions that countries will truly value.

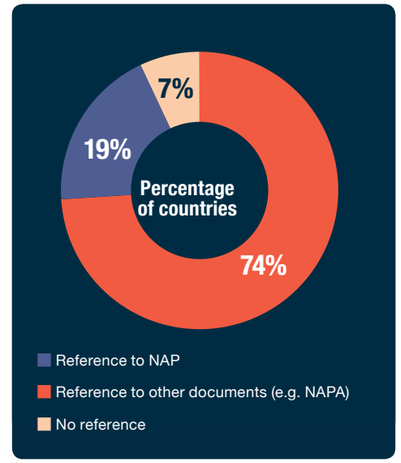
3.2 Relationship between NDCs and NAPs/NAPAs

The analysis shows that a vast majority of the countries include adaptation components that have been identified as part of previous adaptation-related mechanisms and processes, such as NAPs and NAPAs (see Figure 1). 43 countries (74% of NDCs analysed) relied heavily on previous adaptation strategies and plans (such as NAPs and NAPAs) to propose actions to address climate change (see Figure 1).

Of these, 39 countries mostly referenced NAPA while only four countries (Zimbabwe, Namibia, CAR, and Algeria), included references to the NAP process. This reflects in part the imperative to build on existing instruments. However, many of the experts involved in the NDC formulation process conceded that the tight timescale within which NDCs where produced limited the opportunity to undertake a more comprehensive analysis that would have been needed to significantly update existing NAPAs.

From a resource mobilisation and policy design perspective, this suggests at least two lessons. First, that before moving on to NDCs, it might be necessary to study what has been accomplished under NAPs and NAPAs, focussing particularly on the barriers that had hindered the attraction of finance, in order to avoid running into the same difficulties. Second, that policy design processes and timeframes must be formulated to accommodate the weak institutional capacity of many African countries and to allow greater emphasis on the involvement of local people and experts.

Figure 1: NDCs referring to previously existing national adaptation plans (NAPA and NAP)



3.3 The presentation of goals and targets

Of the NDCs analysed, 34 refer only to qualitative goals – that is goals that couch adaptation targets in descriptive forms, without any financial or temperature figures. Qualitative adaptation goals cover a broad range of targets and measures, including developing national adaptation plans to facilitate the governance of natural resources, strengthening stakeholder capacity, understanding and addressing climate vulnerability and mainstreaming adaptation into local economic development plans (see Annex 1).

Of the NDCs analysed, 11 refer to both qualitative and quantitative goals, and eight make no reference to adaptation goals of any kind (see Figure 2). Malawi, for example, seeks to increase land under irrigation from 20,000 to 40,000 hectares by 2030 while building adaptive capacity in climate-resilient agronomic practices. Comoros proposes to ensure that 100% of farmers use water management systems, technologies, and varieties that are adapted to climate change.

Figure 2: Share of countries with goals for adaptation in their NDCs

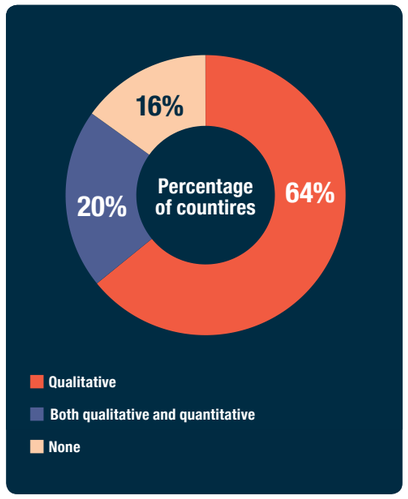
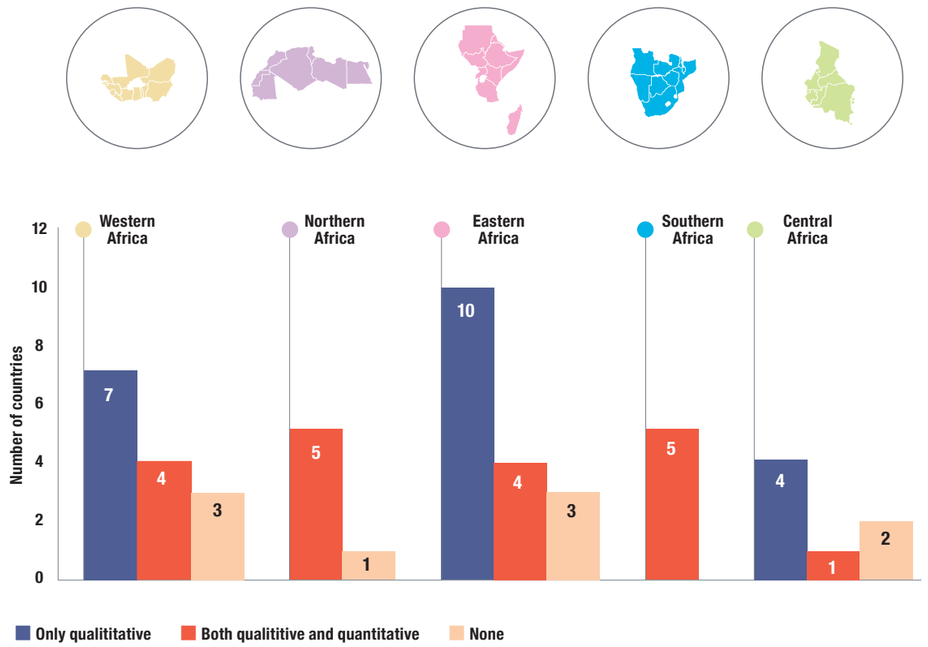


Figure 3: NDCs that include goals for adaptation by region



The high number of solely qualitative goals is a concern from a resource mobilisation perspective because the availability of concrete figures (whether in terms of number of projects to be completed, target number of beneficiaries, or amount of money sought) suggests in depth consideration of adaptation needs and can help galvanise efforts to mobilise climate finance. Such goals also make it easier to track progress, which is very important from a monitoring and reporting perspective.

On a regional basis (see Figure 3), seven countries in Western Africa have included qualitative goals and targets, while four of the 18 countries in Eastern Africa have included both qualitative and quantitative targets. Three countries in both Western and Eastern Africa have no clear targets and goals for adaptation in their NDCs.

While the style of presentation of overarching and sector-specific adaptation goals varies across countries, it seems that the general aim is to reduce vulnerabilities to climate change, enhance resilience and, in some cases, enhance economic development. In this regard, the framing or broad definition of adaptation goals in African NDCs is very much consistent with the intention and language of the adaptation goal in the Paris Agreement.

Since water and agriculture are high priority sectors for adaptation in Africa, examples of goals and targets in the two sectors are presented in Annexes 2 and 3. These show that goals for agriculture mostly include building adaptive capacity and promoting climate-smart strategies. Goals for adaptation in the water sector cover improving water access and related health outcomes, improving irrigation services, building management capacity, and developing new technologies for water conservation.

3.4 Most frequently mentioned sectors and key impacts

NDCs cover various sectors in their adaptation components. The sectors mentioned can be divided into those that give a sense of the climate change vulnerabilities in the country, and those identified as priorities for adaptation. As shown in Figure 4, the most frequently mentioned sectors in terms of both vulnerability and the need for urgent investment include water (43 countries), agriculture (42), disaster risk reduction (35), health (32), biodiversity and ecosystems (31), and human settlement and land management (33). The vulnerabilities identified in these different sectors are presented in Annex 4.

Figure 4: Sectors and subsectors mentioned in NDC adaptation components

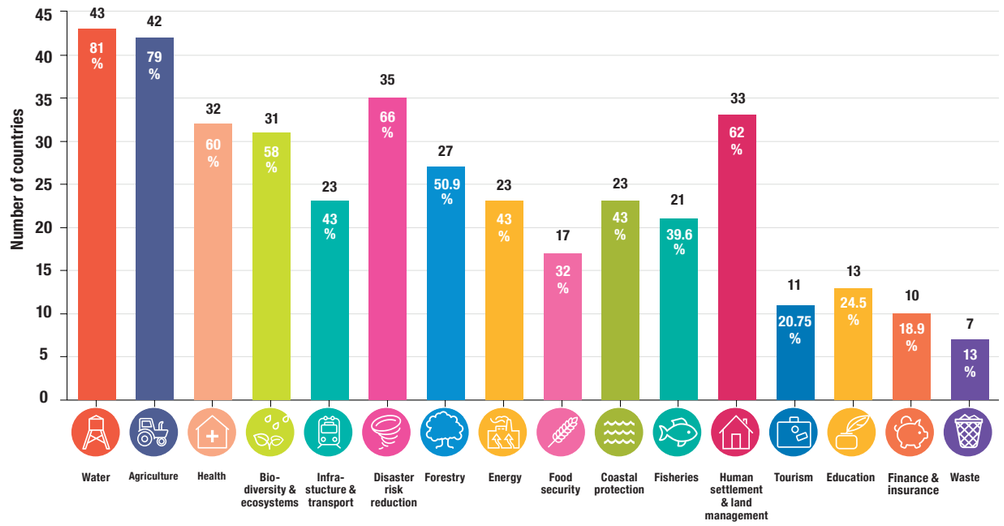


Figure 5: Vulnerable sectors identified in NDC adaptation components

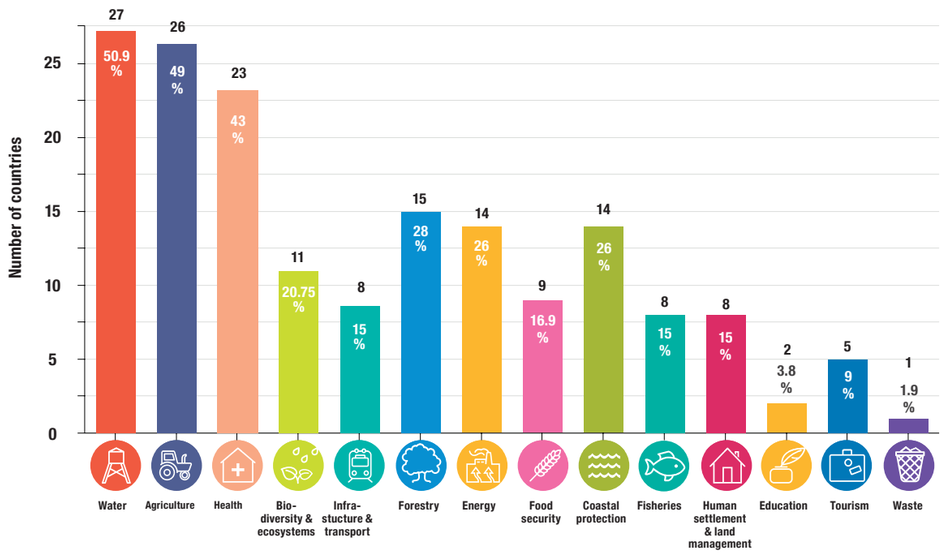
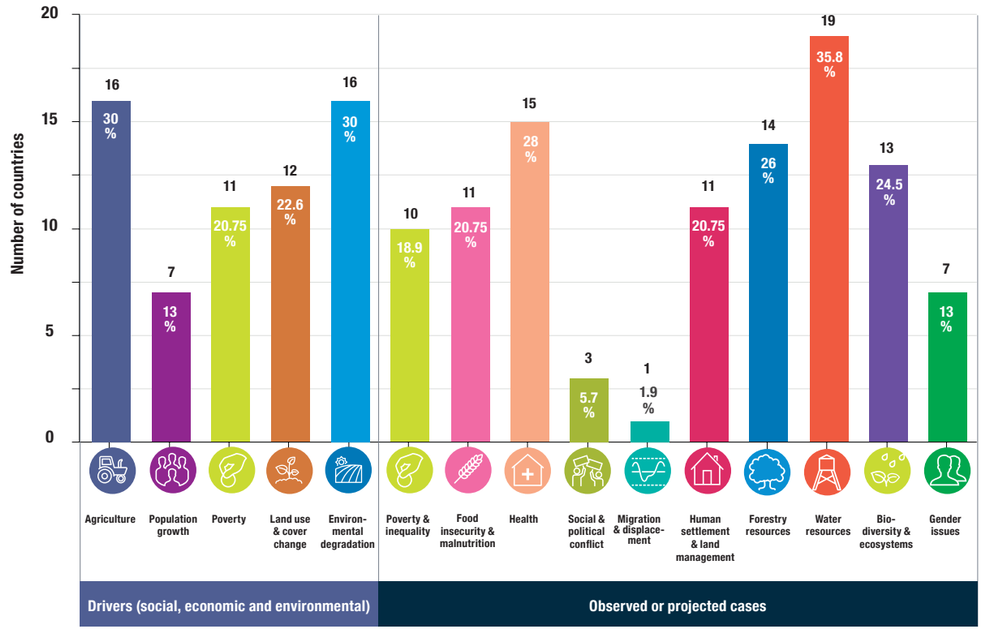


Figure 6: Vulnerabilities identified in NDC adaptation components



3.5 Most vulnerable sectors and climate actions

As shown in Figure 5, the five sectors considered most vulnerable to climate change in the NDCs analysed include forestry (28 countries), water (27), agriculture (26), health (23), and coastal protection (14). 50.9% of NDCs emphasise vulnerabilities in the water sector, suggesting near-term and long-range actions for meeting adaptation commitments. The sector considered least vulnerable and less in need of adaptation intervention is waste, which is mentioned by less than 2% of the NDCs analysed. The topmost climate impacts mentioned in the NDCs analysed are drought, desertification, flooding, soil degradation, loss of arable land, diminishing precipitation rates, temperature rise, sea level rise, landslides, and water shortages (see Annex 4).

Several countries mention the key drivers that exacerbate climate vulnerabilities (see Figure 6). These include economic dependence on agriculture (16 countries), population density and growth (7), poverty and low human development (11), land use and land cover change (12), and environmental degradation (16). Some of the observed or projected vulnerabilities include poverty and inequality (10 countries), food insecurity (11), human health (15), social and political conflicts (3), migration and displacement (1), and gender concerns (7).

These drivers demonstrate the complex relationship between climate adaptation and sustainable development. On the one hand, adaptation can help to reduce vulnerabilities and increase the chances of achieving some development goals. On the other, development activities, if not carefully planned, can increase vulnerabilities and necessitate more adaptation measures. An important part of resource mobilisation and adaptation intervention involves reaching a better understanding of the areas of tension and the options for maximising synergies and minimising trade-offs. It is obvious that interventions that maximise synergies will prove more attractive from investment and sustainable development perspectives.

In terms of climate adaptation action, countries identify 16 priority issues for NDC implementation, including water, agriculture, health, biodiversity and ecosystems, infrastructure and transport, forestry, energy, food security, coastal protection, disaster risk reduction, human settlement and land management, education, fisheries, tourism, waste, and finance and insurance. Based on this distribution (as shown in Figure 7), agriculture emerges as the topmost priority for adaptation in Africa (mentioned by 45% of NDCs), followed closely by water (mentioned by 18 countries), and forestry and health (each mentioned by 14 countries). This supports the previous analysis that African countries are seeking to direct adaptation investments toward sectors that are considered most vulnerable to climate change (see Section 3.2).

Figure 7: Priority sectors mentioned in NDC adaptation components

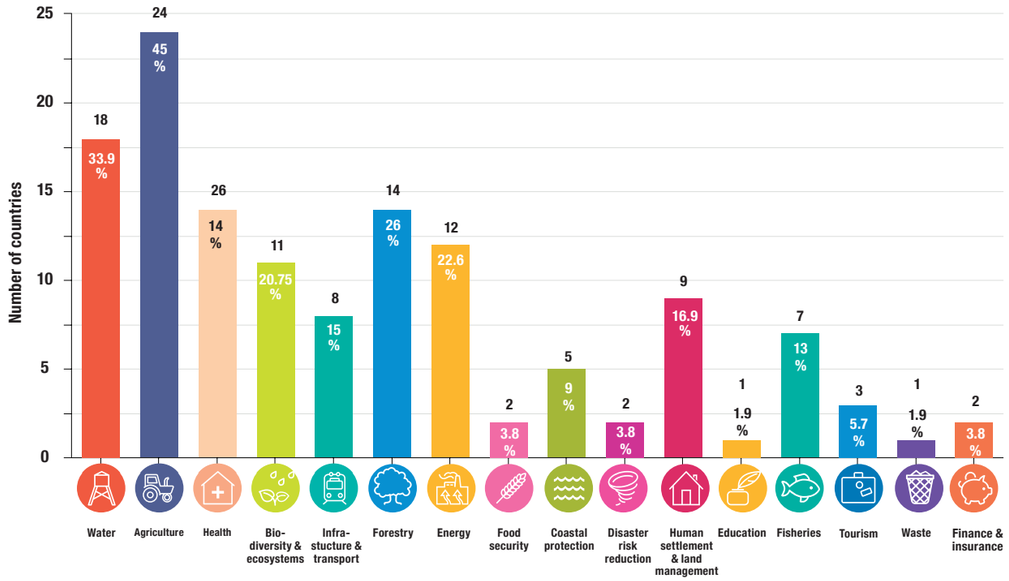


Figure 8: Priority adaptation measures for agriculture

Figure 9: Priority adaptation measures for water management

In the case of agriculture (see Figure 8), priority adaptation measures for cropland management that emerge (explicitly) from the NDCs include breeding and promotion of stress-tolerant varieties (13 countries or 7% of NDCs analysed), improved pest management, soil conservation, crop management, and governance and research. Other frequently referenced adaptation actions include climate-smart agriculture (94% of NDCs), mainstreaming of agro-ecological techniques, climate-resilient agronomic practices, improved techniques for soil conservation, sustainable agro-forest based adaptation, and crop diversification.

Similarly, as shown in Figure 9, priority climate actions for water management in NDCs include large-scale water harvesting, capture, and storage infrastructures; irrigation and drainage systems; ground water exploitation; water quality improvements; and changes to water governance approaches.

Agriculture emerged as the topmost priority for adaptation, in Africa (mentioned by 45% of NDCs), followed closely by water (mentioned by 18 countries), and forestry and health (each mentioned by 14 countries).

For land, forest, and other land-based ecosystem management issues, NDCs recognise the importance of adapting forest management practices, maintaining forest health and vitality, preventing and managing fire, and engaging in forest restoration, as well as afforestation, reforestation, and fire management (see Figure 10).

Additional climate adaptation actions indicated in NDCs include protecting, conserving and restoring other important terrestrial and freshwater ecosystems and their biodiversity, including wetlands, mangroves, rangelands, and grasslands. Some countries indicate forest and land governance as a part of an integrated strategy to build adaptive capacity, while others explicitly note land rehabilitation as an approach to adaptation in the forestry sector (see Figure 11).

A similar picture can be presented for coastal protection, for which priorities in NDCs analysed include measures such as fisheries governance, conservation and restoration of marine ecosystem and biodiversity, coastal zone management, marine aquaculture, inland fisheries management, and marine fisheries governance (see Figure 12). Specific actions considered by countries include expansion of marine protected area networks, generation of revenue through coastal ecotourism activities, protection of fish breeding sites, and coastal zone management (through mangrove and shoreline restoration, sea level rise control systems, and saltwater inundation and intrusion control).

These priority issues and climate actions in African NDCs show the wide scope of adaptation commitments at the country and sectoral levels. They also demonstrate the level of ambition in the different NDCs analysed, specifically in relation to issues where countries have the greatest capacity to act. The analyses therefore provide a basis for measuring success in the context of adaptation action within countries and sub regions and allow us to deepen current insights into the nature and degree of support needed for effective, immediate and long-term action.

NDCs recognise the importance of adapting new forest management practices, restoring other important terrestrial and freshwater ecosystems and their biodiversity, such as wetlands, as well as an integrated strategy to build adaptive capacity'

Figure 10: Priority adaptaton measures for conservation

Figure 11: Priority adaptation measures for forestry

Figure 12: Priority adaptation measures for fisheries and marine resources management

Woman harvesting sea weed on a sea plantation. Jambiani, Zanzibar, Tanzania.
Photo: Marius Dobilas

3.6 Cross-sectoral measures

Africa's NDCs cover three main cross-sectoral adaptation measures: disaster risk reduction and management, climate information and early warning systems, and research and education. Considering disaster risk reduction (DRR) and management (DRM) as an integral part of climate change adaptation, all countries refer to measures that contribute to such efforts. In general, countries mention activities that contribute to understanding disaster risks and impacts, as well as activities, policies, plans and strategies that strengthen DRR and DRM.

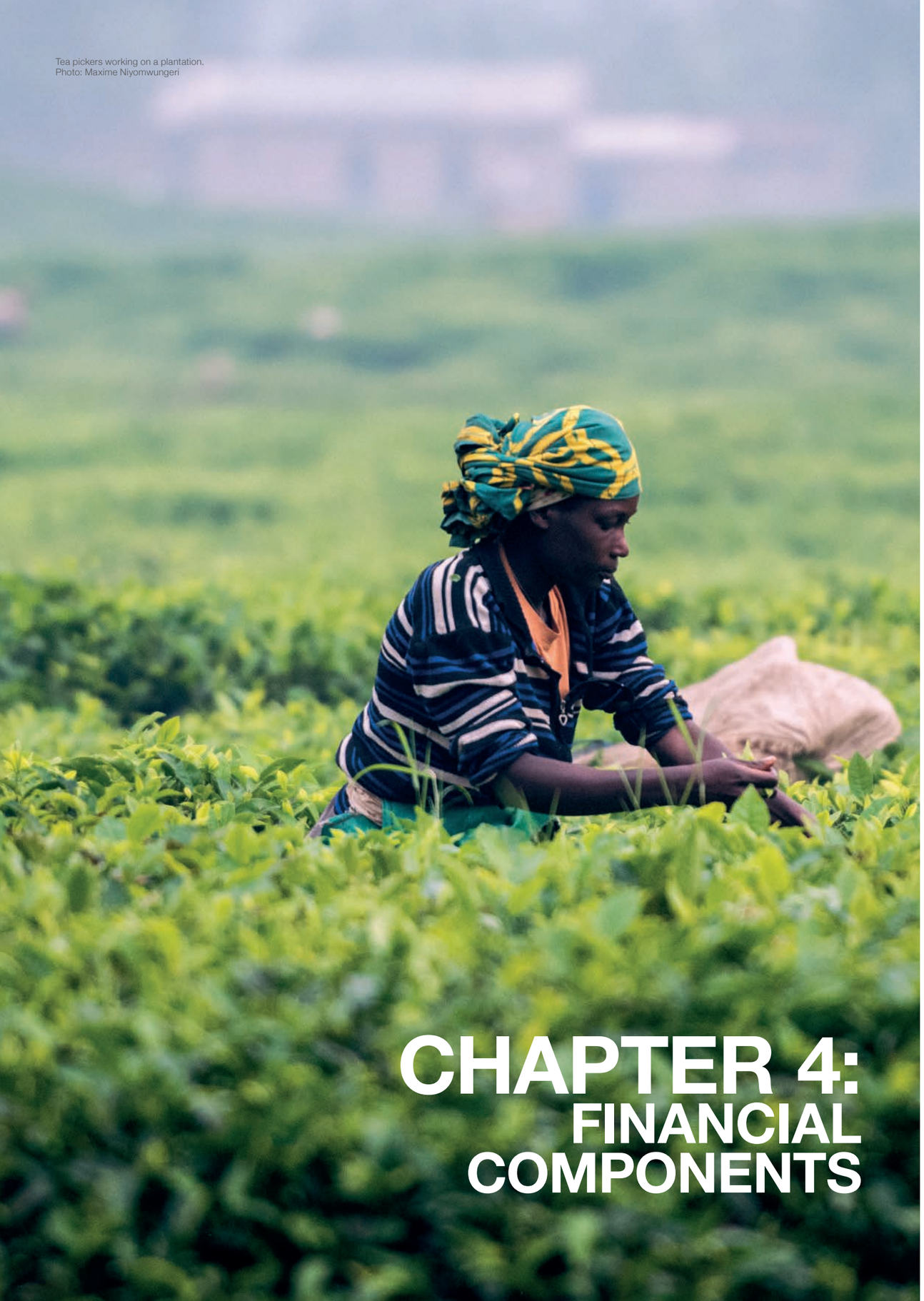
Similarly, countries recognise that specific risk assessments are key to understanding climate change impacts and improving the planning and implementation of relevant adaptation efforts. Madagascar, for example, has stressed the need for capacity building and technology transfer in the area of Geographic Information System (GIS) and remote sensing. Sierra Leone has also referred to disaster preparedness measures in order to strengthen effective response and recovery.

In the case of climate information and early warning systems, many countries clearly underline that these systems play an integral part in understanding disaster risk and improving disaster preparedness. These countries refer to the importance of enhancing climate information services and developing early warning systems to support decision-making in building adaptive capacity and planning for disaster management. Specific examples of countries that discuss climate monitoring technologies in relation to disaster management include Madagascar, which has committed to operationalising its national framework for meteorological services by 2020, and South Sudan, which is committed to gathering and disseminating climate information through improved monitoring and data management systems.

Other countries mention early warning and climate information systems in relation to various sectoral strategies. Somalia, for example, seeks to invest in the provision of seasonal early warning to protect farmers' livelihood and food security. Comoros intends to use early warning systems and climate information to address the emergence of bovine and caprine diseases attributed to climate change. Benin, Tanzania, and Mali explicitly refer to the need for climate information and early warning systems as part of their strategies for enhancing climate-smart agriculture.

Countries also emphasise the need for increased knowledge and information sharing at the level of countries and regions. Areas recommended for research vary significantly from one country to another: ecosystem-based adaptation (Madagascar); development of vulnerability maps and gathering of data on climate change impacts at sectoral and regional level (Uganda); development of local adaptation scenarios (Zambia); vulnerability of socio-economic sectors to climate change (Burundi) etc. Broadly, the goals for research and education relate to the goals and targets set for adaptation, as well as to current, planned, and future actions and priorities (see Annex 5).

Many countries clearly underline that climate information and early warning system play an integral part in understanding disaster risk and improving disaster preparedness



Tea pickers working on a plantation.
Photo: Maxime Niyomwungeri

CHAPTER 4: FINANCIAL COMPONENTS

4.1 INTRODUCTION

Most of Africa's NDCs lack clarity on the quantification of adaptation costs, especially with regards to the distinction between total investments made and finance required for implementing outstanding adaptation commitments. Some countries provide costs but make no separation between costs for mitigation and for adaptation (e.g., Kenya US$40 billion). Others indicate allocations of financial investment made to sectors that they intend to prioritise for adaptation but do not translate such percentages into financial figures. Examples include Burkina Faso that allocates 21% to agriculture, 49% to urban planning, 17% to forestry. This lack of information makes the quantification of both cumulative total spend on adaptation by African countries and their investment needs possible only to a certain extent. This can be regarded as a major weakness in terms of resource mobilisation. This Chapter provides a rough estimate of the cost of adaptation in African NDCs based on projection from the cases where costs, current expenditure and investment need are provided.

4.2 Overall cost of adaptation

Of the 48 NDCs analysed, only 28 provide cost estimates for adaptation (see Table 3). These range from as low as below US$10 million annually for countries including Sierra Leone (US$9 million) and Guinea (US$6.7 million) to as high as US$300 million and above for countries including Kenya (US$400 million), Morocco (US$350 million), and Zambia (US$200 million). The total cost of adaptation based on the 28 countries is in the range of US$3.9 billion a year. For 53 African countries, the cost can be calculated to give US$7.4 billion a year, which is the same order of magnitude as the projection made by the UNEP Adaptation Gap Report (US$7 to 15 billion). However, the sum is a very low percentage of the GDP of the continent (about 4.8% based on IMF figures - US$3.52 trillion - published for 2018).

Table 3: Cost of adaptation by country

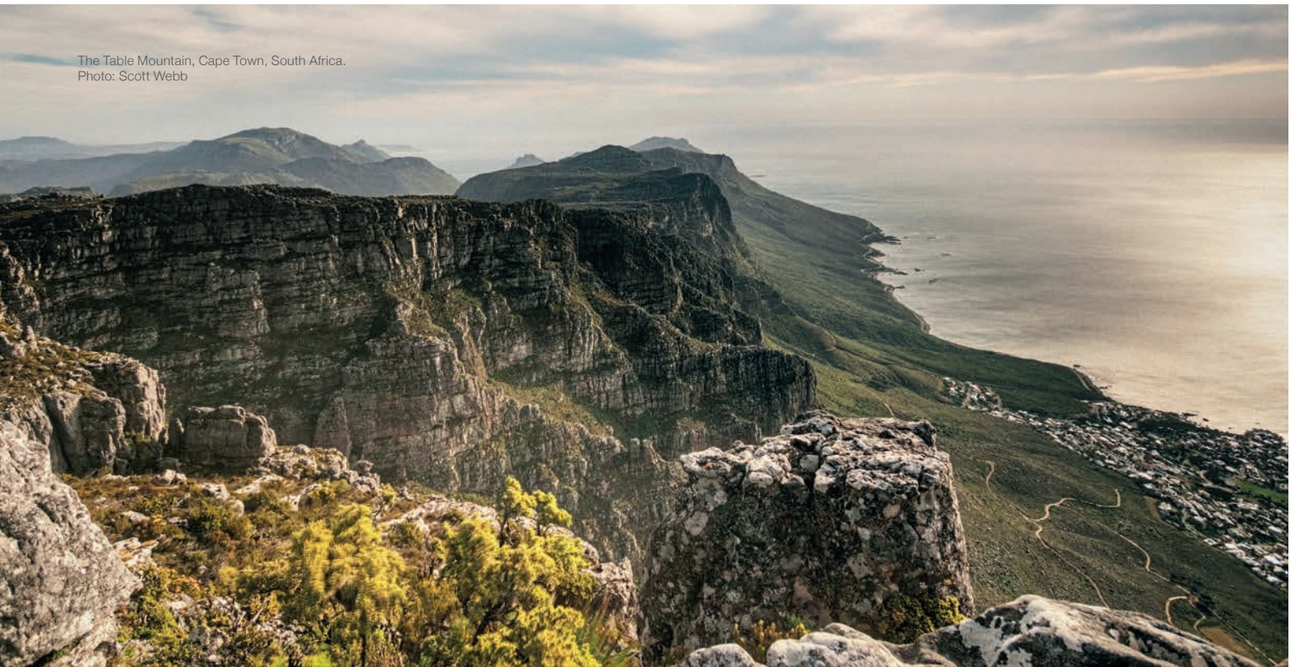
No.	Country	Annual adaptation cost (million USD)	No.	Country	Annual adaptation cost (million USD)
1	Benin	55.946	15	Mauritania	93.774
2	Burkina Faso	39.008	16	Mauritius	40
3	Cameroon	18.150	17	Morocco	350
4	CAR	15.539	18	Namibia	226
5	Chad	141.6	19	Niger	16.070
6	Comoros	3	20	Seychelles	2.950
7	Djibouti	8.330	21	Sierra Leone	9
8	Egypt	730.4	22	Somalia	1.325
9	Ghana	127.9	23	Tanzania	121.5
10	Guinea	6.7	24	Togo	15.4
11	Guinea Bissau	420	25	Sudan	12
12	Kenya	400	26	Uganda	24
13	Madagascar	287.130	27	Zambia	200
14	Mali	136.860	28	Zimbabwe	350
		Total cost			$3.852 billion

On a regional basis, Eastern Africa proposes the highest cost (estimated at US$2.6 billion every year), and Southern Africa the lowest (estimated at US$727 million per year). The difference is driven by the high costs indicated for agriculture, water, energy, and health, which are top priorities for adaptation in Eastern and Western Africa. The implication is also that countries (and by extension regions) will become less vulnerable to climate change as their economies grow and adaptation investments increase.

Puig et al. (2016) have indicated that investments in adaptation will need to increase to six to ten times the current threshold for African countries in order to meet NDC goals and targets for 2030. They also add that African countries could meet the 2050 targets for adaptation if they increase current investments by at least twelve to twenty-two times. It follows from their logic that the annual cost of US$7.4 billion will need to increase to the range of US$ 44.4 to 74 billion to meet the adaptation commitments for 2030. Likewise, adaptation investments will need to be in the range of US$ 88.8 to 162.8 billion to meet all commitments for 2050.

International investment in climate change adaptation is growing, but a significant funding gap remains. The gap in adaptation finance can be estimated at US$3.73 billion when the overall Multilateral Development Banks' (MDB) investment for 2016 and 2017 for Sub-Saharan Africa (SSA) and Middle East and North Africa (MENA), which is US$3.67 billion[5], is compared with the US$7.4 billion projected for adaptation annually until 2020. This estimated gap does not include investments by African countries and investments from bilateral sources, because these are difficult to trace. The gap in adaptation finance could widen considerably by about 6 to 10 times for 2030 and 12 to 22 times for 2050, if current investments do not significantly increase.

[5] The 2017 Joint Report on Multilateral Development Banks' Climate Finance



The Table Mountain, Cape Town, South Africa.
Photo: Scott Webb

4.3 Cost estimates for adaptation priority sectors

Many of the NDCs analysed do not provide costs for adaptation in priority sectors, save for the countries listed in Table 4 below. However, the annual cost of US$7.4 billion projected for adaptation until 2020 can be extrapolated using the analysis done in Chapter 3 to allow an estimate for adaptation in key sectors. Nine priority sectors have been identified and a mean annual cost for adaptation in each sector calculated. On this basis, the mean annual cost for adaptation in priority sectors by 2020 is US$1.74 billion. The estimate includes costs for adaptation in the following sectors: water, agriculture, health, biodiversity conservation, infrastructure and transport, forestry, energy, fisheries, and tourism (see Table 5).

Table 4: Countries with adaptation costs allocated by sector

Country	Sectors (annual costs estimated in million USD)						
	Agriculture	Water	Health	Forests/land management	Biodiversity	Energy	Capacity building/ research
Burundi	10					4.5	29.252
Cameroon	385	600	300	150			70
DRC	1.563			50	118	7.35	
Burkina Faso (until 2020)	556			345		29.3	22.6

Table 5: Cost of adaptation in priority sectors

Priority sector		Number of countries	% of African NDCs submitted	Estimated cost of adaptation (billion US$)	Mean annual cost (billion US$)
	Water	18	33.9	2.471	0.3
	Agriculture	24	45	3.280	0.4
	Health	14	26	1.895	0.2
	Biodiversity and ecosystems	11	20.75	1.599	0.2
	Infrastructure and transport	8	15	1.156	0.1
	Forestry	14	26	2.003	0.2
	Energy	12	22.6	1.741	0.2
	Fisheries	7	13	1.001	0.1
	Tourism	3	5.7	0.439	0.04
Mean annual cost of adaptation in priority sectors by 2020					$1.74 billion

4.4 Quantification methodology

The quantification methodology used in the previous section is based on the sum of adaptation costs provided by African countries in their NDCs. This is the first time such an approach has been used to estimate total annual costs for adaptation as well as costs in priority sectors. The procedure is suitable because the NDCs analysed have not clearly explained the methodologies followed to estimate costs of adaptation, or the premise on which they have concluded that international support is required. This lack of information, together with the differences in costs, limits the comparability of the financial components of adaptation in African NDCs.

The focus on sectors, conditionality, and estimates for planned activities is deliberate because it helps reveal the incomparability of NDCs in terms of the financial components proposed by countries. The inconsistencies and dissimilarities observed are mainly due to the different understandings of conditional and unconditional costs, differences in timeframes, and the inconsistencies in currencies used (Nakhooda et al. 2011).

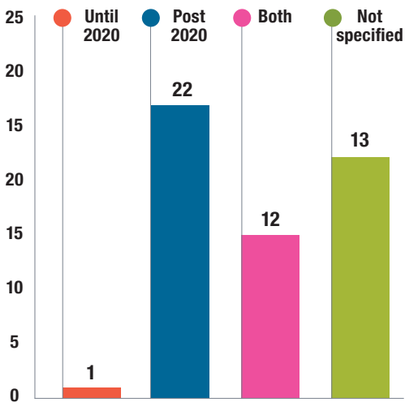
For instance, while some countries take unconditional costs to mean contributions from countries, others estimate such costs as part of the international support countries require to implement their NDCs (Puig et al. 2016). Additional reasons for inconsistencies include the difficulty in distinguishing adaptation from development finance, as well as the methodological challenges involved in the economic assessment of adaptation (see IPCC 2014; Watkiss 2015).

4.5 Timeframe

Adaptation estimates provided by African countries are based on three different timeframes: 2020, 2030, and 2050. These timeframes indicate periods when specific adaptation commitments outlined in the NDCs will be met. Countries have adopted timeframes chiefly on the basis of times specified for developing and implementing climate adaptation policies, plans, projects, and programmes. The inconsistencies across NDCs analysed in this report can also be observed in terms of timeframes, as some countries provide specific timeframes while others do not. In addition, most countries specify the target years of 2020 and 2030 but fail to indicate the start year for implementation.

Of the 48 NDCs analysed, 35 specify clear timeframes for adaptation actions (e.g. DRC, which specifies the period until 2020; and Zambia, Zimbabwe, Sudan, South Africa, Niger, Nigeria, Mauritius, Mauritania etc, which specify post-2020 targets). At the same time, 12 countries include 2020 and post-2020 timelines for achieving adaptation goals (see Figure 13), while 13 NDCs present no specific timeframes for adaptation.

Figure 13: NDCs specifying timeframes for adaptation actions



4.6 Conditionality

African NDCs mostly explore "conditionality" with respect to sectors to which domestic and international support would be directed. The analysis shows that 49% of domestically supported adaptation investments will be made in the agriculture sector, 40% in the water sector, and 11% in the forestry and related sectors (see figure 14). In contrast (see figure 15), international support will benefit health (by 28%), energy (55%) and biodiversity sectors (17%).

Alternatively, some countries determined unconditional contributions through a stock-taking exercise, focusing on the sum of existing and approved policies and ongoing processes. A few countries have included strategies and actions that have yet to be approved, and projects already financed wither through national budgets or international support. The way countries differ in their conception and estimation of unconditional and conditional targets, makes it difficult to differentiate between the actual value of domestic and international contributions in the NDCs (Day et al. 2016 p.4). Consequently, the adaptation costs and related financial components analysed in this report are interpreted with caution, because the methodologies for determining conditions vary from country to country.

Nine countries explicitly state the volume of domestic finance they intend to spend on implementing adaptation actions (see table 6). Based on the costs provided by these countries, the total annual cost of domestic support is estimated at US$ 506.6 million until 2030. For the 48 countries analysed in this report, it is estimated that US$ 2.7 billion will need to be contributed annually by African countries until 2030 to meet commitments for adaptation in their NDCs. Comparing this figure to the overall cost of US7.4 billion projected for implementing adaptation actions, it emerges that 36% of the required yearly financial support will come from domestic sources, while 64% (or US$ 4.7 billion) will come from international sources. These costs, however, do not include allocations made in national budgets and national development plans.

Figure 14: Top three priority issues to be addressed through domestic support

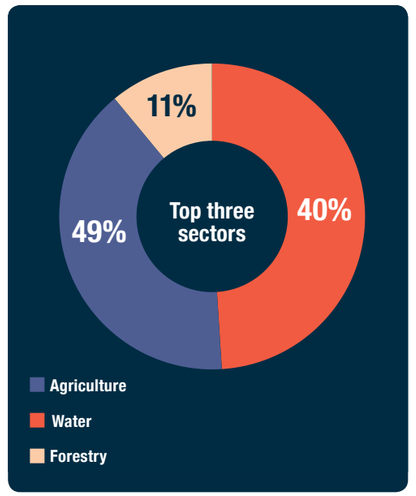
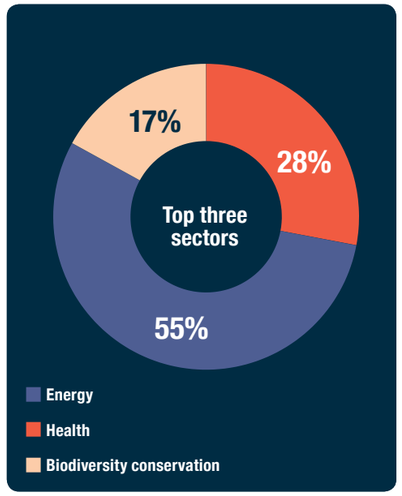


Figure 15: Three priority issues to be addressed through international support



Expenditure on adaptation in the last 10 to 20 years is difficult to trace for countries in Africa, because comprehensive budget data covering both budgeted expenditure and final outturn are rarely available in one dataset or a single publication. Budgeted expenditure on climate-related activities is mostly publically available, though it's hard to pinpoint the size of funding allocated to adaptation activities at different times. What is traceable is funding disbursed through bilateral and multilateral channels. For instance, Schaefer and colleagues (2013) note that as of June 2013, a total volume of US$ 39.99 billion has been reported by developed countries as pledged, allocated, and implemented climate finance. This includes US$35.9 billion in public finance and US$3 billion in private finance (Fallasch and De Marez 2013).

A closer look at the nine countries listed in table 6 shows that while some have proposed ambitious budgets for adaptation (such as Comoros), others have put forward budgets that are significantly lower than their GDPs (such as Ghana). Moreover, there are cases of budgeted expenditure that do not reflect the adaptation needs on the ground. For instance, whereas CAR is ranked the most vulnerable country to climate change in the world (Maplecroft 2016), it has committed only 1% of its GDP to adaptation. At the same time, other countries ranked in the top 5 worst performing countries by the same index (DR Congo- 2nd; Liberia- 4th; and South Sudan- 5th) have proposed no domestic contributions to the implementation of adaptation actions in their NDCs. The difference in costs allocated to adaptation in both NDCs and national budgets may not be unrelated to the GDPs of these countries as well as the size of climate finance they have been able to access.

While further insights can be obtained from national budgets and recent economic development plans, it is difficult to pinpoint adaptation-relevant expenditure in most national budgets because many activities are not listed as part of the national response to climate change. For those countries for which budgeted expenditures can be found, the policy areas most relevant to climate change need to be identified as well as details for sectoral commitments based on outcomes projected for projects, programmes, and plans. While the approach may reveal interesting insights into the current situation with adaptation financing within African countries, it can miss out on important costs because of analytical difficulties.

Table 6: Percent of GDP that is adaptation finance to come from domestic sources

Country	NDC finance from domestic sources (US$/ annum until 2030)	GDP (2017) in US$	Adaptation share of GDP (%)
Benin	14.4 million	9.3 billion	6.5
CAR	1.9 million	1.9 billion	1
Chad	27.9 million	9.9 billion	3.5
Comoros	300 million	648.9 million	2.2
Ghana	42.1 million	47.3 billion	1.1
Madagascar	11.4 million	11.5 billion	1
Niger	3.4 million	8.1 billion	2.4
Senegal	18.3 million	16.4 billion	8.9
Zimbabwe	87.2 million	17.9 billion	2
		TOTAL	506.6 million

Nine countries explicitly state the volume of domestic finance they intend to spend on implementing adaptation actions

4.7 Sources of finance

A consideration of the annual costs to be met by international and national sources (US$ 4.7 billion and US$ 2.7 billion respectively) indicates that there is a need for significant financial support to implement adaptation activities across the 48 African countries analysed. What is particularly worrisome is that despite the seeming clarity on whose support will be what for NDC implementation, NDCs are vague in terms of the distribution of these costs across the sources mentioned. For instance, while some NDCs refer to domestic resources as a source of support for adaptation in their countries, they do not specify whether these resources will come from private or public sources.

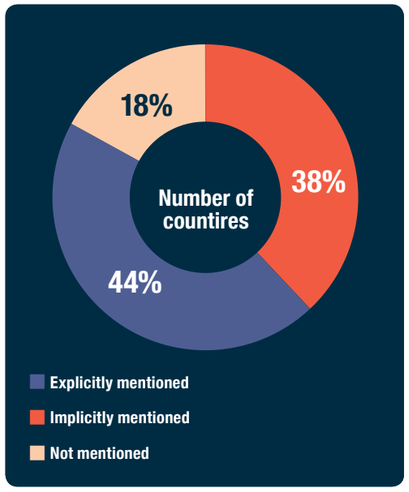
In a similar vein, the countries that refer to international sources don't specify costs for the sources identified for support, including carbon markets, private sector, the Green Climate Fund (GCF), bilateral and multilateral agencies, and loans. While this makes it difficult to distribute costs in terms of source, the emphasis on GCF in particular can be considered a tendency towards public finance sources.

Generally, nine countries explicitly state the volume of domestic finance they intend to spend on implementing adaptation actions. Some countries (e.g., Morocco) indicate that domestic public resources from sectors such as energy and infrastructure will contribute to meeting domestic financial targets. Others (e.g., Sierra Leone) identify finance mobilised from levies for controlling environmentally harmful activities as a source of domestic public finance, while South Africa, for instance, points to investments in renewable energy, transport, and related infrastructure. In many instances, it is believed that domestic contributions will go toward financing adaptation activities that are not more expensive than business-as-usual activities, whereas international support can offset additional costs that facilitate transformative projects.

In the case of private finance, three countries (Burkina Faso, Cape Verde, Cote D'Ivoire) clearly emphasise the private sector as another important source of financing for the implementation of adaptation components in NDCs. Ivory Coast, for example, refers to climate bonds as a way to raise capital for both private and public expenditure. While private finance could play a critical role in complementing public sector funding, there are challenges to conceptualising engagement in adaptation activities, as well as understanding the connection between private and public sector support activities (Puig et al 2016). The point is that private financing will only materialise if it can generate a decent rate of return.

An additional avenue of adaptation finance mentioned by some countries is international market mechanisms, which can serve as an important means to providing additional finance to off-set non-financial costs like technology transfer (see Höhne et al. 2015 p.3) and achieving adaptation-mitigation co-benefits. While most NDCs do not explicitly mention international market mechanisms, the reference to co-benefits can be assumed to be a focus on such sources of finance in the near or long-term.

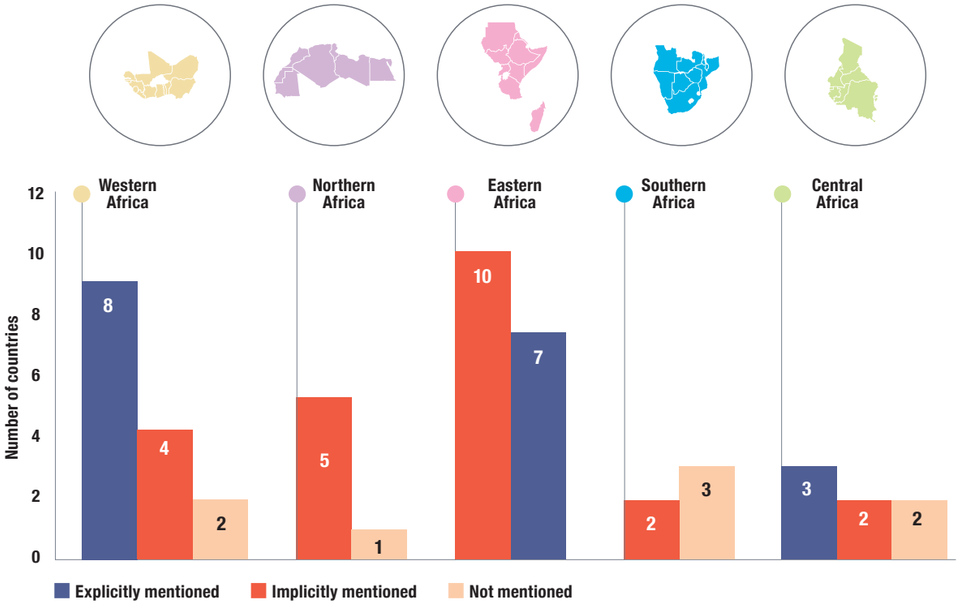
Figure 16 : Countries that mention co-benefits of adaptation and mitigation



In that regard, 18 countries make an implicit mention of co-benefits, 21 make an explicit mention, and 9 make no mention (see Figure 16). Of these, more NDCs from Eastern Africa make either an implicit (7) or explicit reference (10) to co-benefits, while the majority of countries from Northern Africa (5) implicitly mention co-benefits of adaptation and mitigation in their NDCs (see Figure 17).

Cutting across the various sources of finance described above is multilateral and bilateral support, a crucial contribution to developing countries' efforts on adaptation. A recent UNEP report indicates that the total bilateral and multilateral finance for climate change adaptation reached US$25 billion in 2014, of which US$22.5 billion targeted developing countries[7]. An example of a multilateral initiative is Pilot Programme for Climate Resilience (PPCR), which finances technical assistance and investments to support efforts to mainstream climate risks and resilience into core development planning and implementation. Bilateral sources including support from many developed nations are playing a significant role in the region.

Figure 17: Regions that mention co-benefits of adaptation and mitigation



Multilateral and bilateral support also takes the form of projects with both adaptation and mitigation co-benefits. For example, the AfDB has supported various climate change projects with adaptation and mitigation co-benefits, including interventions to help rural households adapt to climate change in Malawi; expanding geothermal development in Kenya; delivering wind power in the Lake Turkana area in north-western Kenya; building thermo-solar and concentrated solar plants in Morocco; promoting efforts to scale up renewable energy investments in Mali; delivering Climate-Smart Agriculture (CSA) in Burundi; and fighting aquatic plant proliferation in West Africa etc. These initiatives are similar in focus to those implemented by the World Bank, EU, and various UN agencies. All aim to address the adaptation finance gap in Africa by considering multiple sources including private finance.

4.8 Potential for the Adaptation Benefit Mechanism (ABM)

African countries recognise that there are various options for mobilising support for the implementation of adaptation components. An emphasis on private sector finance has emerged in current adaptation discussions because the overall volume of finance needed to support adaptation in African countries is beyond the public finance estimates provided so far. Therefore, tools such as the ABM can be utilised by countries to mobilise additional support to implement their NDCs. The ABM seeks to create a results-based finance model to motivate private sector investment in adaptation. It is designed to help host countries meet their Paris commitments, for example by raising their ambition and accelerating their progress toward a long-term goal of zero emissions. The primary goals include delivering adaptation technologies to developing countries to make them less vulnerable to climate change and helping them achieve the Copenhagen pledge of mobilising 50% of the US$100 billion projected for adaptation by 2020.

It implies from the analysis that mechanisms such as the ABM can thrive for sectors such as agriculture and water, because many of the target enterprises are active in sectors that are sensitive to climate change. From the analysis done in Chapter 3, for example, the ABM could best be implemented across Africa in the agriculture and water sectors, which are also highlighted as top priorities for adaptation in African NDCs. The adaptation goals, targets, and measures described in Chapter 3 provide a good basis for rolling out the ABM in a select number of African countries, especially where conditions are suitable for developing and transferring technologies for climate change adaptation.

Goals and targets proposed for agriculture and water are similar to those set for pilot interventions implemented by the AfDB and the UN Capital Development Fund (UNCDF) in various African countries. Some of these ABM pilot interventions include: solar powered irrigation pumps to help farmers overcome unreliable rainfall, drip irrigation technology to make better use of water resources, climate resilient agriculture to diversify farm income streams, and development of weather information systems to provide farmers with accurate weather forecasts.

[7] UNEP DTU Adaptation Gap Report, 2016

Masai People and their sheep, goat herd at wild with flood at Masai Mara.
Photo: 1001slide

CHAPTER 5: NON-FINANCIAL COMPONENTS

5.1 INTRODUCTION

The non-financial components included in the NDCs analysed include: research and education, planning and mainstreaming, monitoring and learning, capacity development, and technology development and transfer. These components are discussed in the next sections in order to understand the priorities for adaptation investment and identify the nature of support that countries require to effectively facilitate the means of NDC implementation.

5.2 Adaptation evidence and assessments

All NDCs emphasise the importance of generating new knowledge and evidence about climate trends in order to project future climate scenarios and take appropriate adaptation actions. Assessing proposed and ongoing adaptation actions in NDCs against projected vulnerabilities is useful for understanding gaps and opportunities in the coverage of adaptation priorities. Key gaps identified by the analysis include a lack of synergy between sectors and institutions and a lack of relevant data mentioned by less than one-third of African countries (see Table 7). These are considered gaps in adaptation potential because of the expected increase in adaptation actions (at both policy and process level) as a result of trends in regional climate change.

The limitations and caveats of data highlighted at many points in this report demonstrate the need for the generation of accurate and reliable data on adaptation actions. Such assessments could be used in the establishment of a comprehensive database to report finance flows from donor countries or agencies through bilateral and multilateral bodies. In this regard, policy-makers ought to ensure that all processes for NDC implementation include monitoring, reporting, and verification of financial support as key elements. Transparency mechanisms informed by new knowledge and data can improve adaptation action at the national and subnational levels by increasing certainty about the adequacy of measures to bridge identified gaps. Increasingly available data will also help policymakers to strengthen systems for monitoring and evaluation and shape requirements for capacity building and technical assistance.

Key gaps identified by the analysis include a lack of synergy between sectors and institutions and a lack of relevant data

Table 7: Gaps and barriers identified in NDCs

COUNTRY	GAPS AND BARRIERS (TO ADAPTATION ACTION) IDENTIFIED IN NDCs
Central African Republic	Military and political crisis, lack of synergies between sectoral policies and institutions; illiteracy rate, absence of interregional socioeconomic equality, lack of financial resources, poor ability to absorb funds, extreme poverty
Chad	Poor understanding of the concept of climate change by the vast majority of society, illiteracy, lack of involvement from women, poor integration of CC policies into national and sectorial policies, insufficient climate governance structure, poor livelihood capacity of communities, slow implementation of measures, failure to consider CC in general State budget, insufficient international funding
Comoros	Shortcomings in institutional, political, strategic and juridical levels
Cote d'Ivoire	Lack of policy integration of climate change into national and sectorial policies, low capacity of livelihoods (physical, national, social, institutional) in rural communities, limited understanding of the concept of CC, illiteracy
Gabon	Need for an undertaking for conservation projects to implement the National Strategy for Coastal Adaptation
Guinea	Gap in financing, weak climate data and statistics, insufficient integration into national development planning and governmental institutions, non-respect for development plans of the territory
Lesotho	Specific barriers to adaptation are technological, economic/ financial, and institutional
Namibia	Inadequate human capacity, restricted access to technology, low public awareness, insufficient funding, lack of climate information and observation
Niger	Illiteracy, human resources, logistics, institutional conflicts, etc
Nigeria	food insecurity, poor access to energy and high unemployment remain principal constraints on economic development and are of primary concern to the government.
Sao Tome and Principe	Financial barriers, lack of skilled human resources, lack of access to modern technology
Seychelles	Barriers in the areas of capacity-building, education and awareness, research and monitoring, technology, and legislation
Sierra Leone	Policy and regulatory weaknesses, difficulties in accessing commercial finance and technical capacity
Somalia	Major obstacles in reference to renewable energy are political, financial and institutional
South Africa	Needs time to finance its efforts in NDC
Uganda	Constraints due to its national circumstance as an LDC

5.3 Adaptation planning and mainstreaming

NDCs have put a greater emphasis on the need to mainstream adaptation into current policy and development. African countries recognise that the process to formulate and implement NAPs provides an opportunity to address synergies between adaptation and development. Thus, NDCs mention NAPs as a means by which countries can better articulate their adaptation needs in the light of their development needs and priorities, as well as preparing them for effective implementation on the ground. Four countries explicitly mention a need for supporting the NAP process as part of strengthening policy processes in order to enrich NDC implementation. These are Algeria, Cape Verde, CAR, and Morocco.

Four countries explicitly mention a need for supporting the NAP process as part of strengthening policy processes

Similarly, current and future needs identified for the NAP process focus expressly on finishing the formulation process by 2020 and effectively mainstreaming core outputs into national sustainable development planning. Furthermore, all countries have made a strong commitment towards mainstreaming adaptation into sectoral and national development planning processes. More specifically, 24 countries mention gender issues (including mainstreaming gender responsive approaches in policies and strategies, addressing gender concerns in national and sectoral plans, and enhancing gender inclusiveness in adaptation policies and projects), or refer to Sustainable Development Goals (SDGs) or sustainable development. Zimbabwe, for example, is mainstreaming gender responsive climate policies and underscores its efforts to support vulnerable groups (women, youth, and children) in adaptation action within all sectors of the economy. Likewise, Malawi acknowledges that such vulnerable groups bear the greatest burden of the impacts of climate change and should be at the heart of projects seeking to foster multi-level learning and create rewards for participation.

NDCs identify various entry points for mainstreaming adaptation into national development planning. For instance, some countries call for a comprehensive strategy that allows for setting ambitious social and economic targets beyond poverty alleviation and economic growth at the national level. The goal is to show the connection between sector-level priorities and policies and local development and wellbeing objectives (Casado-Asensio et al. 2016). There are countries that call for the integration of interlinked sectors like water, energy, agriculture, and environment in order to achieve broader results and maximise development impacts. This is known as cross-sectoral mainstreaming and can also be done across areas such as disaster risk reduction and sustainable development. For instance, integrating adaptation into multi-hazard risk management may be an effective strategy for mainstreaming DRR into sustainable development (IPCC 2012).

Another strategy mentioned in NDCs is the establishment of financial cycles for adaptation (e.g., Ghana) so that they can be mainstreamed into relevant planning and budgeting processes. The aim is to develop and deliver national climate change strategies and plans with budgetary considerations in mind. In general, adaptation mainstreaming in the context of NDCs can be achieved by anchoring the goals and objectives in national policy frameworks and regional strategies; developing integrated measures to facilitate the engagement of national, regional, and local governments; coordinating decision-making and multi-governance stakeholder engagement; and providing an interface between science and policy through mechanisms for dialogue, participation, and accountability.

Looking at the 2017-18 national budgets and economic development plans of African countries, it becomes clear that adaptation is being mainstreamed into national sustainable development efforts. For instance, in Kenya, Benin, Uganda, and Zambia, climate-smart agriculture is effectively fostering a dialogue on climate change impacts and adaptation in the agriculture sector; land management planning and natural resource management have been identified as adequate conduits for adaptation in the land sector in Burkina Faso, because they address livelihood vulnerability and increase resilience; and increased water efficiency and productivity are goals for adaptation in the water sector in Comoros, CAR, and Morocco, where water stress is expressed as a primary impact of climate change. Altogether, these strategies and plans are creating opportunities for mainstreaming adaptation into national development planning while meeting sustainable development objectives.

From a policy making perspective, there is a need for more research to yield a better understanding of the linkages between adaptation and development and identify entry points into national economic development planning. There is also a need to further develop partnerships for mainstreaming adaptation and to evaluate institutional and capacity needs for designing and delivering mainstreaming efforts. The examples of adaptation actions mainstreamed into development planning in African countries emphasise the importance of establishing robust monitoring networks so that adequate evidence can inform policy processes. This way, countries can progressively generate the information they need in order to successfully design and deliver adaptation actions.

5.4 Adaptation, monitoring, evaluation, and reporting

Thirty-three countries, that is, 62% of African NDCs, underscore the importance of investing in monitoring systems to keep track of adaptation actions (see figure 18). However, only 1 country (Zimbabwe) provides a specific plan for monitoring and evaluation of adaptation actions at the national level.

Furthermore, only 14 countries give information on the status of monitoring and evaluation of adaptation action; 2 countries (Zimbabwe and Burkina Faso) indicate that systems for monitoring, evaluation, and reporting are already in place, 12 countries or 23% of NDCs state that monitoring, evaluation and reporting processes for adaptation are being planned, and 39 countries (73% of NDCs) do not provide any relevant information.

The scope of monitoring for most countries covers activities to control project delivery processes at the national and subnational levels, and periodic reporting to meet regional and global commitments. Countries express a concern that monitoring, evaluation, and reporting are challenged by lack of data availability and capacity, including climate and socio-economic data to detect, predict, and respond to climate change, as well as poor coordination to involve all stakeholders and establish clear roles and responsibilities. Countries that present a monitoring strategy, stress the importance of monitoring and evaluation and indicate the progress they are making with assessments and monitoring are listed in table 9.

Figure 18: Status of monitoring, evaluation and reporting activities

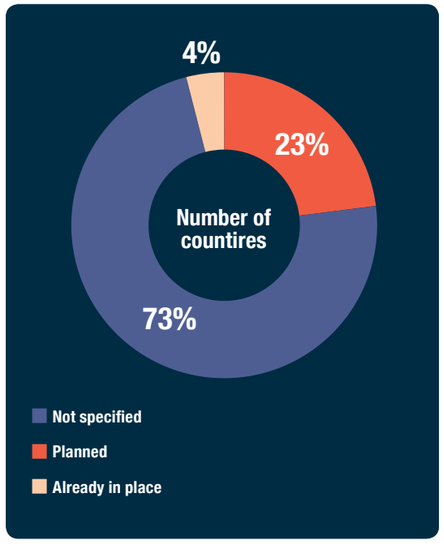


Table 8: Information on monitoring, evaluation and reporting in NDCs

Country	Monitoring strategy	Stresses importance of MER	Includes specific plan for MER	Status of MER
Algeria	MRV (monitoring, notification, and reporting) system	●		
Angola				
Benin	MNV (monitoring, notification, and verification) system	●		Already in place
Botswana				
Burkina Faso	External annual evaluation	●		Planned
Burundi		●		
Cameroon	MRV system	●		
Cape Verde	M&E framework	●		
CAR		●		
Chad		●		
Comoros	Working group assessments	●		Planned
Congo				
Cote D'Ivoire				
Djibouti				
DR Congo		●		Planned
Egypt				
Equatorial Guinea				
Eritrea				
Ethiopia	Regular consultative dialogues	●		
Gabon	M&E strategy	●		
Gambia	M&E for agriculture. No general M&E plan	●		
Ghana	M&E system to be integrated into existing M&E plans	●		
Guinea	External evaluation every 5 years	●		
Guinea-Bissau				Planned
Kenya	Review of NAP and climate change strategy every 5 years	●		
Lesotho	M&E indicator system	●		Planned
Liberia				
Madagascar				

Table 8: Information on monitoring, evaluation and reporting in NDCs

Country	Monitoring strategy	Stresses importance of MER	Includes specific plan for MER	Status of MER
Malawi	M&E plan implemented by ministry	●		
Mali				
Mauritania	M&E based on national action plan for the environment	●		Planned
Mauritius	M&E plan implemented by climate change department	●		Planned
Morocco	M&E strategy	●		Planned
Mozambique				Planned
Namibia		●		
Niger	M&E system	●		
Nigeria	Gap analysis to inform MRV development	●		
Rwanda	M&E by Green Economy Technical Coordinating Committee & National Fund for Environment & Climate Change	●		Planned
Sao Tome & Principe		●		
Seychelles	M&E by national climate change committee	●		Planned
Senegal				
Sierra Leone				
South Africa		●		Planned
South Sudan				
Somalia		●		
Sudan				
Swaziland				
Tanzania		●		
Togo	Existing M&E system	●		
Tunisia				
Uganda		●		
Zambia	M&E mainstreaming	●		
Zimbabwe	M&E system	●	●	Already in place

Nuclear reactor cooling tower, Cape Town, South Africa.
Photo: e2dan

5.5 IMPLEMENTATION OF ADAPTATION ACTIONS

5.5.1 Financial support

Countries mention current and future support needs for implementing the adaptation commitments of their NDCs (see Annex 6). The analysis shows that all African countries need financial assistance to help shoulder the burden of climate change adaptation. It was found that 44 countries explicitly mention a need for financial support in their NDCs, with the focus principally on supporting policy and sector-level interventions, including research, education, monitoring, project implementation, evaluation, reporting, and mainstreaming. Some countries (18) mention the quantified costs of planned actions, while others merely refer to a general need for international support. Many of these countries, however, do not provide estimates for implementing adaptation actions as the 28 countries mentioned in Chapter 4 have done.

Many countries do not go into the same level of detail when presenting their exact expectations from financial flows. Some only mention economy-wide financial estimates, while others present some form of sector allocation (in percentages). Overall, what is apparent from the analysis is that policy makers in African countries need to create conditions that attract adaptation finance without compromising efforts to deliver development goals. One way could be to design a broad spectrum of policies, incentives and support mechanisms to increase access to innovative instruments and financing modalities for adaptation.

5.5.2 Capacity building

Besides financial support, the need for capacity building in support and technology development and transfer is reflected in many NDCs. 36 countries mention a need for capacity building or technical support for NDC implementation (see table 9).

The top four capacity needs identified are:

1. mobilising resources for NDC implementation;
2. developing NDC implementation plans;
3. developing information base or monitoring systems; and
4. building institutional structures and coordination mechanisms.

It was found that 44 countries explicitly mention a need for financial support in their NDCs

Table 9: Characterisation of technical and financial capacity building needs by country

Country	Capacity building needs/priorities			
	Technical capacity		Financial capacity	
	Develop NDC implementation plans	Develop information base for MER	Build institutional structures and coordination mechanisms	Mobilise resources for NDC implementation
Algeria		✓	✓	✓
Benin	✓	✓	✓	✓
Burundi		✓	✓	✓
Cameroon		✓	✓	✓
Cape Verde	✓	✓		✓
Chad	✓		✓	✓
Comoros		✓	✓	✓
Congo		✓	✓	✓
DRC	✓	✓	✓	✓
Côte D'Ivoire	✓	✓	✓	✓
Djibouti		✓	✓	✓
Egypt		✓		✓
Ethiopia		✓	✓	✓
Eswatini		✓	✓	✓
Gambia	✓	✓	✓	✓
Ghana		✓	✓	✓
Kenya		✓	✓	✓
Lesotho	✓	✓	✓	✓
Madagascar		✓		✓
Malawi		✓	✓	✓
Mali	✓	✓	✓	✓
Mauritius		✓		✓
Morocco		✓	✓	✓
Namibia	✓	✓	✓	✓
Niger	✓	✓	✓	✓
Nigeria		✓	✓	✓
Rwanda		✓	✓	✓
Sao Tome and Principe		✓	✓	✓
Sierra Leone	✓	✓	✓	✓
South Africa		✓	✓	✓
Sudan	✓	✓	✓	✓
Tanzania		✓	✓	✓
Togo		✓	✓	✓
Uganda		✓	✓	✓
Zambia		✓	✓	✓

Okavango delta (Okavango Grassland). Botswana, South-Western Africa.
Photo: Vadim Petrakov

Additional areas identified as extremely relevant include estimating implementation costs and building awareness and ownership of NDCs at the national level. Capacity to design, deliver, and evaluate projects relevant to the Sustainable Development Goals (SDGs) is considered a key need. For instance, while Zimbabwe requires capacity building support to develop plans for implementing SDGs, others (such as Ghana and Malawi) require support to assess sustainable development impacts. Some countries (including Zambia, Benin and Ghana) also underline the need for capacity to revise NDCs based on the Paris Agreement, and to mainstream gender and other considerations into NDC implementation.

In sum, there is need to establish institutional structures and organisational networks that can form or reform mechanisms for capacity building. Such structures should facilitate accountability and transparency by strengthening the capacities of national institutions to plan, budget, and track adaptation finance. Capacity building should also involve designing and implementing adaptation projects and plans that enable the generation of new knowledge and allow the development and application of robust M&E systems to track the effectiveness of adaptation finance at national and sub-national levels.

5.5.3 Technology development and transfer

Countries further mention technology development and transfer as another important means of implementing the adaptation components of their NDCs. 36 countries mention a need for transferring and developing technology for NDC implementation (see Table 10).

The top three technology development and transfer needs for NDC implementation are:

1. generating climate information;
2. designing and implementing early warning system; and
3. data collection, analysis and storage.

The most relevant areas identified include generating climate information, promoting early warning systems and designing and delivering climate-smart projects. Madagascar, for example, requires technology to generate data and implement strategies for disaster risk management, while Mali requires technology to implement adaptation projects in various sectors, specifically water and agriculture, where innovative strategies are needed to address evolving climate change adaptation needs and priorities.

There is need to establish institutional structures and organisational networks that can form or reform mechanisms for capacity building

Table 10: Options for monitoring, evaluation and reporting

Country	Rationale for technology development and transfer		
	Research and education	Project implementation	MER
Algeria	✓		
Benin	✓	✓	✓
Burundi	✓	✓	
Cameroon	✓	✓	
Cape Verde	✓		
Chad	✓	✓	
Comoros	✓		✓
Congo	✓	✓	
DRC	✓	✓	✓
Côte D'Ivoire	✓	✓	✓
Djibouti	✓	✓	
Egypt	✓	✓	✓
Ethiopia	✓	✓	
Eswatini	✓		✓
Gambia	✓	✓	
Ghana	✓	✓	✓
Kenya	✓	✓	✓
Lesotho	✓		✓
Madagascar	✓		
Malawi	✓	✓	
Mali	✓	✓	
Mauritius	✓		✓
Morocco	✓	✓	✓
Namibia	✓	✓	
Niger	✓	✓	✓
Nigeria	✓	✓	
Rwanda	✓	✓	✓
Sao Tome and Principe	✓		
Sierra Leone	✓	✓	
South Africa	✓	✓	✓
Sudan	✓	✓	
Tanzania	✓	✓	
Togo	✓	✓	
Uganda	✓	✓	
Zambia	✓	✓	

Clearly, African NDCs recognise the importance of developing and transferring technology for successful adaptation actions. Policy making in these countries should therefore focus on generating data and plans to develop, deploy, and transfer adaptation technologies. National budgets and development plans need to clarify funding arrangements for technology transfer both within and after the timeframes specified for implementing NDCs. Furthermore, plans and budgets for technology development and transfer should consider the special needs and circumstances in countries in order to leverage existing efforts, and they should emphasise the relevance of continuous local and international support to the delivery of adaptation goals.

5.5.4 Roles for the Africa NDC Hub

The support requirements highlighted in the previous sections emphasise the important role of the Africa NDC Hub as a resource pool for African countries, together with local and international support institutions. The Africa NDC Hub was established in November 2017 as a response to requests from African countries for support with the delivery of adaptation components in their NDCs.

Based on these pillars, the Africa NDC Hub has intensified efforts to implement activities in the 2018-2020 work programme so as to support countries in meeting their contributions towards adaptation goals in a long-term and sustainable way. The Hub is catalysing the process by which decision-makers in key sectors of the economy rethink policy, development, and technology pathways, and it thereby offers the opportunity to facilitate the alignment of national action and development plans with the Paris Agreement goals.

The Africa NDC Hub serves as both a resource pool and a collaborative platform, founded primarily on three pillars:

1. to strengthen national climate policies and translate NDCs into country programmes which incorporate adaptation, mitigation, and development;
2. to mobilise long-term and adequate means of implementation, including capacity building, mainstreaming and monitoring, in order to achieve and sustain commitments while scaling-up ambition;
3. to coordinate, advocate and partner with other actors to increase the pace and the scale of reach and research.

Through its partners, the Hub is also further mobilising the means implementing adaptation action – finance, capacity building, and technology – which will help countries identify the resources they need to successfully implement adaptation actions. Through its partners, the Hub provides technical assistance and training to national actors on direct access, blending, and coordination of climate finance. These roles for the Hub effectively promote the development of strong partnerships and contribute to the global advocacy drive to promote urgent, effective and equitable responses to climate change.

Through its partners, the Hub provides technical assistance and training to national actors on direct access, blending, and coordination of climate finance

African Penguins, Boulders Beach, Cape Town.
Photo: Jean Wimmerlin

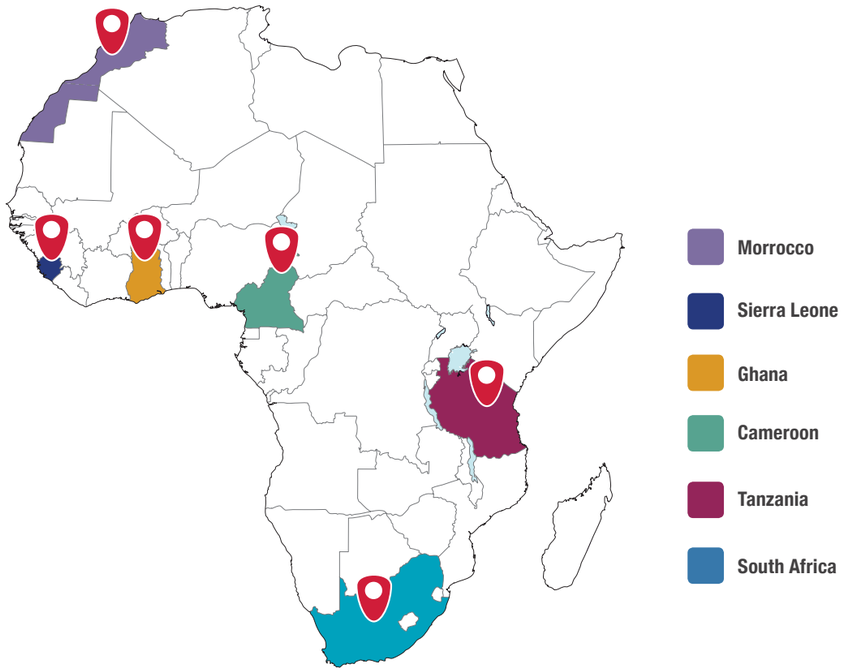
CHAPTER 6: CASE COUNTRY ANALYSIS

Chapter Six

6.1 INTRODUCTION

Analyses of the NDCs of six African countries – Ghana, Cameroon, Morocco, Sierra Leone, South Africa and Tanzania – were undertaken in order to dig deeper into current adaptation practices, priorities, and gaps, and to inform an understanding of the scope of adaptation across the five regions of Africa. The findings are crucial for further NDC development and revisions, as well as for identifying and mobilising resources from existing and emerging climate policy instruments. Moreover, country cases can help the Africa NDC Support Hub to obtain the necessary contextual information and insights to identify drivers of failure and success, which can then provide a basis for wider regional choices. However, country cases do not provide an account of which country (or region) has done better than all others in terms of NDC development and implementation, or climate change adaptation more broadly.

Figure 19: Location of case countries



6.2 Overview of case study countries

The six case study countries demonstrate a range of socio-economic and political differences and similarities, as well as range of institutional capacity (or lack thereof) for achieving the adaptation goals set out in their NDCs (see Table 11 for analysis of the adaptation components of NDCs). The countries include: South Africa, the largest emitter of greenhouse gas on the continent, ranked 19th globally (8.98 metric tons per capita according to the 2014 World Bank assessment); Morocco, one of the largest emitters in the world, ranked 61st globally (1.744); and four of the lowest contributors - Ghana (0.537), Cameroon (0.315), Tanzania (0.221), and Sierra Leone (0.185).

Two of these cases, Sierra Leone and Tanzania, have LDC status. Morocco and South Africa are considered middle-income countries. Ghana and Cameroon are classed as having low human development. Moreover, the case countries have varied relationships with Official Development Assistance (ODA). Tanzania and Sierra Leone are some of the principal recipients of ODA globally, while Morocco and South Africa receive less than 1% of GDP from international sources.

Table 11: Key adaptation components in the NDCs of case countries

NDC adaptation component	Ghana	Cameroon	Morocco	Sierra Leone	South Africa	Tanzania
Refers only to qualitative adaptation goals	✓	✓		✓	✓	
Includes both qualitative and quantitative goals			✓			✓
Mentions current projects and plans	✓		✓		✓	
Refers to adaptation policies (NAPA and/ or NAP)	✓	✓	✓	✓	✓	✓
Estimates general cost of adaptation	✓		✓	✓		✓
Stresses importance of M&E	✓	✓	✓		✓	✓
Refers to SDGs or sustainable development	✓	✓	✓	✓		✓
Indicates need for financial support	✓	✓	✓	✓	✓	✓
Requires capacity building support	✓	✓	✓	✓		✓
Requires support for technology development and transfer	✓	✓	✓	✓		✓

Furthermore, all case countries are signatories (and hence parties to) various Multilateral Environmental Agreements (MEAs), including the UNFCCC. They have also operationalised the Kyoto Protocol, though not all have signed the Copenhagen Accord (including Cameroon, where many key actors think the accord is not right for Africa). As parties to these conventions, the case countries demonstrate their commitment on the international stage to addressing climate change challenges and tapping into related opportunities.

Nonetheless, climate change is not seen in these countries as an issue that requires domestic political commitment and action, even though there is compliance with the requirements set by international frameworks (such as UNFCCC) for reporting and resource mobilisation.

Perceptions regarding policy-level mainstreaming of climate change adaptation into governmental policies and plans is mixed

Perceptions regarding policy-level mainstreaming of climate change adaptation into governmental policies and plans is mixed, with many actors suggesting that several elements (including capacity, sustainable finance etc) need to be in place to plan and implement effective and equitable climate actions.

These perceptions reflect the capacity of institutions charged with making and implementing climate change decisions in these countries. Not only are they weak in terms of capacity to plan, implement and evaluate policies and projects, but they are also poorly coordinated and funded. It is notable that in all the case countries, varying levels of confusion exist about who is responsible for what, and this impedes the alignment of climate finance with local development priorities (as in Ghana and Sierra Leone). A common theme is that all countries have had to comply with donor requirements rather than seeing donors respect their budget cycles, priorities, and management systems.

Closely related to this alignment problem is the intense competition for available climate finance. In Ghana, for instance, many government agencies are fully aware of potential funding opportunities for climate change projects, and this is believed to be the cause of increasing friction between stakeholders as they compete for limited resources. Despite the high level of funding awareness among case study countries, countries like Sierra Leone, Cameroon, and Ghana lack the capacity they need to lodge time-bound applications, and or to deal effectively with the pressure applied by international capitals to make spending happen quickly and to produce tangible results in the shortest time possible. The result is a constantly evolving pressure on countries to meet different requirements set by different funders to qualify for financial support, and local priorities and systems are therefore being dismantled.

Young African girl drinking clean water from a tap. Bamako, Mali.
Photo: Riccardo Mayer

A common theme appears to be countries often receive smaller amounts than were negotiated and even these do not always arrive

Another common theme is the level of rigour applied to all types of funding support (whether small loans or large grants), meaning that the process of accessing and using climate financing is difficult and labour-intensive. Many of the actors in these countries attribute their inability to quantify previous and current climate finance streams to these difficulties, coupled with a lack of technical capacity in government to effectively provide robust costings for past and current actions.

Case countries have not been able to mainstream climate finance effectively into their local budgets and as a result they do not have a comprehensive report on country-level expenditures on climate change. Each of the countries has an institutional structure dedicated to managing climate change funding, but challenges remain, particularly in accounting and financial reporting.

Another important issue observed in all case study countries is the growing frustration with the insignificance and unpredictability of climate finance flows. The common theme appears to be countries often receive smaller amounts than were negotiated and even these do not always arrive. All case countries agree that climate change finance remains unpredictable despite the rigorous requirements that they have met in most cases. There is no clear evidence from these countries that funding for climate change adaptation, for instance, has been regular and well-coordinated. This is even the case in countries with advanced coordination mechanisms between governments and the donor community, such as Ghana, Morocco, Tanzania, and South Africa.

Additionally, only South Africa and Morocco have properly explored funding from the private sector to address climate change. They have used such resources mostly to fund large-scale energy projects. Cameroon and Sierra Leone have yet to fully explore the potential of private sector funding, though they have taken steps towards jointly implementing mechanisms like REDD and CDM with non-governmental actors.

Private sector players have yet to effectively mobilise themselves around climate change (energy security, food productivity etc), and need to make more effort to align the emerging adaptation interests in various sectors with their own strategies for funding and technical support at the national level.

Alongside the challenge of mapping financial support, there is also the critical issue of measuring results, especially in terms of agreeing on the information that should be captured and shared. The lack of common frameworks for monitoring, evaluation, and reporting has constrained efforts to measure and learn from the results of climate change actions. In the context of adaptation, Tanzania and Sierra Leone attribute the lack of a national reporting framework to the absence of national strategies (or action plans) and to the failure to integrate adaptation processes into national development processes.

Countries rely on the monitoring and evaluation standards and frameworks offered by funding agencies, which conflict with locally devised mechanisms for accountability. The common expectation is that NDCs, once fully operationalised, will provide a mechanism for capturing adaptation results, thus facilitating support planning, implementation, and mainstreaming efforts at multiple governance levels. However, it is unclear when identified structures (and processes) for operationalising results frameworks will take off, although there is some idea of the level of capacity that needs to be developed.

6.3 Country-specific NDC adaptation information

6.3.1 Ghana

GENERAL INFORMATION:

Location: Western Africa

Population: 24 million

Ratified Paris Agreement: YES 21 SEPTEMBER 2016

NDC submitted: YES 20 SEPTEMBER 2016

Reference to NAP: NAP not mentioned

Vulnerability: HIGH RISK COUNTRY (VERISK MAPLECROFT, 2016)

NDC DESIGN PROCESS: Ghana's INDC was prepared through a comprehensive and participatory process with high-level cabinet approval.

VULNERABILITIES

Climate change impacts on water resources, agriculture, human health, forests, fisheries, infrastructure, and coastal zones.

SECTORS

Sectors mentioned in the NDC: Water, agriculture, health, infrastructure and transport, forestry, DRR, food security, coastal protection, human settlement and land management, waste

Vulnerable sectors: Not explicitly mentioned

Priority sectors: Water, agriculture (33% of GDP), health, infrastructure and transport, forestry

Cross-sectoral measures: DRR, climate information services, research

GOALS, MEASURES, AND BARRIERS

Adaptation goal: To increase climate resilience and decrease vulnerability for enhanced sustainable development.

Adaptation measures: NDC is anchored in the anticipated 40-year long-term development, the GSGDA II, National Climate Change Policy as well as the Low Carbon Development Strategy. Many national policies, laws and regulation will support implementation in the first 10-year period and beyond with the possibility of mid-term review in 2025. The proposed measures to achieve the INDC goal will build on existing measures and strategies. The existing legal frameworks will have to be revised accordingly. These revisions are subject to approval by Ghana's Parliament. Key actions include: resilience building in vulnerable agricultural landscapes, value addition-based utilization of forest resources, city-wide resilient infrastructure planning, early warning and disaster prevention, managing climate-induced health risk, integrated water resources management, and resilience for vulnerable groups.

Challenges: Not explicitly mentioned in NDC, though other materials (e.g., USAID 2013) refer to low public awareness of the risks of climate change, slow efforts to mainstream adaptation into sectoral and local planning efforts, and fewer projects addressing climate impacts on coastal zones.

FINANCE

Annual cost of adaptation: $127.9 million

Percent of GDP: 2.9% of GDP- $42.804 billion (World Bank, 2016)

Estimated annual domestic contribution: $42 million

Estimated annual international support required: $85.9 million

Sources of finance: GCF, bilateral and multilateral sources, international market mechanisms (such as CDM)

Timeframe for contribution: 2020 to 2030

Conditionality: International sources (68%); domestic sources (32%)

IMPLEMENTATION

Requirements: Finance ($8.29 billion), capacity building and technology support required.

Monitoring and evaluation: Monitoring plan to be integrated to existing systems.

6.3.2 Cameroon

GENERAL INFORMATION:

Location: Central Africa

Population: 23.4 million (World Bank 2016)

Ratified Paris Agreement: YES 29 July 2016

NDC submitted: YES 29 July 2016

Reference to NAP: NAP started

Vulnerability: HIGH RISK COUNTRY (VERISK MAPLECROFT, 2016)

NDC DESIGN PROCESS: Not specified

VULNERABILITIES

Climate change impacts on water resources, agriculture, human health, forests, fisheries, infrastructure, and coastal zones.

SECTORS

Sectors mentioned in the NDC: Water, agriculture, health, forestry, energy, disaster risk reduction, food security, fisheries, tourism, human settlement and land management, education

Vulnerable sectors: Water, agriculture, health

Priority sectors: Not specified

GOALS, MEASURES, AND BARRIERS

Adaptation goal: Adaptation goal is anchored in a vision to become an emerging country by 2036.Approaches for how to reach long-term goals are also included.

Adaptation measures: Cameroon provided information about their planning and implementation processes in the following categories: institutional framework, implementation of INDC, monitoring and evaluation (MRV), communication, updating of INDC, financing and capacity building. The plan is to implement the action plan for 2016-2020 (developed on the basis of the intervention strategy 2016-2025), covering the areas: agriculture/breeding/fisheries, land settlement (planning)/risk management, energy/industry, forests, water management/ health/social, strengthening of capacities/communication.

Challenges: Not specified.

FINANCE

Annual cost of adaptation: $18.150 million

Percent of GDP: 5.6% of GDP- $32.218 billion (World Bank, 2016)

Sources of finance: National budget, GCF, private sector, carbon market

Timeframe for contribution: 2016 to 2020

Conditionality: Conditional only

IMPLEMENTATION

Requirements: Finance, capacity building and technology support required.

Monitoring and evaluation: MRV planned, indicators of adaptation and vulnerability to be determined.

6.3.3 Morocco

GENERAL INFORMATION:

Location: Northern Africa

Population: 35 million

Ratified Paris Agreement: YES 21 SEPTEMBER 2016

NDC submitted: YES 18 SEPTEMBER 2016

Reference to NAP: NAP started

Vulnerability: HIGH RISK COUNTRY (VERISK MAPLECROFT, 2016)

NDC DESIGN PROCESS: Morocco undertook a broad, two-year stakeholder consultation process. During this process, Morocco reviewed the policies and programmes that are being implemented to combat global warming and determined how ambitious the country wants to be in its NDC. The NDC design process culminated in a national conference, held on June 2, 2015 in Rabat. Consultations held after the adoption of the Paris Agreement strengthened the foundations of the NDC and enabled a renewal of stakeholder engagement by ensuring their full support for the implementation of the commitments included in the present document.

VULNERABILITIES

Water scarcity (trough reduction in precipitation, temperature increase), declining agricultural production, desertification, and flooding and rising sea levels.

SECTORS

Sectors mentioned in the NDC: Water, agriculture, biodiversity and ecosystems, infrastructure and transport, forestry, fisheries, tourism, education

Vulnerable sectors: Water, agriculture, health, forestry, coastal protection, fisheries

Priority sectors: Not explicitly mentioned

Cross-sectoral measures: DRR, climate information services, research

GOALS, MEASURES, AND BARRIERS

Adaptation goal: Focused on five priority sectors: mountain regions, the coast, oases, agricultural areas and urban areas. The general vision and four more specific long-term goals are presented.

Approaches for how to reach long-term goals are also included.

Adaptation measures: To finalise drafting of NAP. Clear, quantified sector-wide policy targets for 2020 and 2030 are set.

Challenges: Not specified

FINANCE

Annual cost of adaptation:
$350 million

Percent of GDP: 2.9% of GDP- $103.606 billion (World Bank, 2016)

Estimated annual domestic contribution: Not specified

Estimated annual international support required: Not specified

Sources of finance: Domestic sources, bilateral and multilateral sources, private sector

Timeframe for contribution: 2020 to 2030

Conditionality: Not specified

IMPLEMENTATION

Requirements: Clear future support requirements are mentioned. Support from the international community is in particularly required in terms of: financial resources, technical and institutional capacity building, legal advice and M&E.

Monitoring and evaluation: M&E system to assess vulnerability and adaptation has been piloted in two regions. Morocco plans to expand this system to other regions and complement it with a national governance mechanism.

6.3.4 Sierra Leone

GENERAL INFORMATION:

Location: Western Africa

Population: 7 million (World Bank 2016)

Ratified Paris Agreement: YES 1 November 2016

NDC submitted: YES 1 November 2016

Reference to NAP: NAP not mentioned

Vulnerability: EXTREME RISK COUNTRY (VERISK MAPLECROFT, 2016)

NDC DESIGN PROCESS: Not specified

VULNERABILITIES

Third most vulnerable country in the world (2014 Maplecroft index)

SECTORS

Sectors mentioned in the NDC: Agriculture, health, DRR, coastal protection, fisheries, tourism, finance and insurance, human settlement and land management

Vulnerable sectors: Not explicitly mentioned

Priority sectors: Agriculture, health, DRR, coastal protection, fisheries, tourism, finance and insurance

Cross-sectoral measures: DRR, climate information services, research

GOALS, MEASURES, AND BARRIERS

Adaptation goal: To reduce or minimize risks by improving adaptive capacity, reducing vulnerability to climate change impacts and increasing the resilience and sustainable wellbeing of all citizens.

Adaptation measures: Climate Change Strategy, National Climate Change Action Plan and the NAPA. The result shall be reviewed every five years to inform the medium-term plan. Key measure is to mainstream green growth into national development process through (a) prioritised activities that will support Sierra Leone to transition to a low-carbon and climate-resilient economy, (b) mobilisation of resources and (c) monitoring, reporting and verification of impacts on the citizens and economy of Sierra Leone due to the implementation of the strategy and action plan.

Challenges: Policy and regulatory weaknesses, difficulties in accessing commercial finance and technical capacity

FINANCE

Annual cost of adaptation:
$9 million

Percent of GDP: 2.9% of GDP – $3.556 billion (World Bank, 2016)

Estimated annual domestic contribution: Not specified

Estimated annual international support required: Not specified

Sources of finance: Domestic sources, bilateral and multilateral sources, private sector, GCF

Timeframe for contribution: 2020 to 2030

Conditionality: Not specified

IMPLEMENTATION

Requirements: International support required in the form of financial resources, technology transfer and capacity building. Overall financial requirement for implementing the NDC until 2020 is $900 million.

Monitoring and evaluation: Not explicitly mentioned

6.3.5 South Africa

GENERAL INFORMATION:

Location: Southern Africa

Population: 56 million

Ratified Paris Agreement: YES 21 NOVEMBER 2016

NDC submitted: YES 21 NOVEMBER 2016

Reference to NAP: NAP planned

Vulnerability: MEDIUM RISK COUNTRY (VERISK MAPLECROFT, 2016)

NDC DESIGN PROCESS: Not specified

VULNERABILITIES

Climate change impacts on water and food security, health, human settlements, and infrastructure and ecosystem services.

SECTORS

Sectors mentioned in the NDC: Water, agriculture, biodiversity and ecosystems, forestry, energy, DRR, human settlement and land management, education

Vulnerable sectors: Water, health, biodiversity and ecosystems, human settlement and land management, food security

Priority sectors: Not explicitly mentioned

Cross-sectoral measures: DRR, climate information services, research

GOALS, MEASURES, AND BARRIERS

Adaptation goal: To align adaptation priorities with National Development Plan (NDP) produced in 2012, which provides a '2030 vision' to guide the country's sustainable development trajectory where poverty is eliminated, and inequalities are reduced by 2030.

Adaptation measures: The approach to the current NDC is based on the national climate policy (NCCRP) and the national development plan (NDP). Measures seek to achieve six specific adaptation targets: 1) develop a National Adaptation Plan and begin operationalisation as part of implementing the National Climate Change Response Policy (NCCRP) for the period 2020-2025 and for the period 2025-2030; 2) take into account climate considerations in national development, sub-national and sector policy frameworks for the period 2020 to 2030; 3) build the necessary institutional capacity for climate change response planning and implementation for the period 2020-2030; 4) develop an early warning, vulnerability and adaptation monitoring system for key climate vulnerable sectors and geographic areas for the period 2020-2030, and reporting in terms of the National Adaptation Plan with rolling five-year implementation periods; 5) develop a vulnerability assessment and adaptation needs framework by 2020 to support a continuous presentation of adaptation needs; and 6) communicate past investments in adaptation for education and awareness as well as for international recognition.

Challenges: Not specified

FINANCE

Annual cost of adaptation: not explicitly mentioned

Percent of GDP: $317.741 billion (World Bank, 2016)

Estimated annual domestic contribution: Not specified

Estimated annual international support required: Not specified

Sources of finance: Not specified

Timeframe for contribution: 2020 to 2030

Conditionality: Not specified

IMPLEMENTATION

Requirements: Seeks recognition of its national investments in adaptation as part of its relative fair global effort. International support not explicitly mentioned.

Monitoring and evaluation: Not explicitly mentioned

6.3.6 Tanzania

GENERAL INFORMATION:

Location: Eastern Africa

Population: 55 million

Ratified Paris Agreement: YES 18 May 2018

NDC submitted: YES 18 May 2018

Reference to NAP: NAP planned

Vulnerability: HIGH RISK COUNTRY (VERISK MAPLECROFT, 2016)

NDC DESIGN PROCESS: NDC was prepared in a consultative and inclusive manner through technical and policy dialogues. A national technical team was established, with representatives from various sectors and relevant institutions. Broad-based national and sub-national stakeholders' consultative workshops were held during the process. The consultations brought together Civil Society Organizations (CSOs), Academic and Research institutions, the Private sector, and government institutions from across the country. National policies, legislations, strategies, programmes and action plans together with UNFCCC decisions guided the preparation of the document.

VULNERABILITIES

Climate change impacts in coastal zones, and on public health, energy supply and demand, infrastructure, water resources, agricultural production and availability of ecosystem goods and services.

SECTORS

Sectors mentioned in the NDC: Water, agriculture, health, biodiversity and ecosystems, forestry, energy, coastal protection, fisheries, tourism, human settlement and land management

Vulnerable sectors: Water, agriculture, health, biodiversity and ecosystems, infrastructure and transport, energy, coastal protection

Priority sectors: Water, agriculture, health, biodiversity and ecosystems, forestry, energy, fisheries, tourism, human settlement and land management

Cross-sectoral measures: DRR, climate information services, research

GOALS, MEASURES, AND BARRIERS

Adaptation goal: To embark on a climate-resilient development pathway, reduce climate-related disasters from 70% to 50%, and reduce the impacts of the spatial and temporal variability of declining rainfall, including frequent droughts and floods which have implications for all productive sectors and ecosystems, particularly the agricultural sector. The country intends to increase access to clean and safe water from 60% to 75% and to reduce the impacts of sea level rise to the island and coastal communities, infrastructure and ecosystems.

Adaptation measures: Measures are aligned to the Tanzania Development Vision (2025), Zanzibar Vision (2020), and Tanzania Five Year Development Plan (2011/12-2015/16) and are anchored in the National Climate Change Strategy (2012) and the Zanzibar Climate Change Strategy (2014). Qualitative actions will be undertaken in the following sectors: agriculture, livestock, forestry, energy, coastal, marine environment and fisheries, water resources, tourism, human settlements and health.

Challenges: Not specified

FINANCE

Annual cost of adaptation: $121.5 million

Percent of GDP: 2.5% of GDP- $47.388 billion (World Bank, 2016)

Estimated annual domestic contribution: Not specified

Estimated annual international support required: Not specified

Sources of finance: Not explicitly mentioned

Timeframe for contribution: 2020 to 2030

Conditionality: Not specified

IMPLEMENTATION

Requirements: NDC to be implemented incrementally, depending upon the availability of adequate and predictable financial and technical support from the international community. Concrete figures for adaptation mentioned.

Monitoring and evaluation: Implementation will be guided by various policies, development vision programmes, strategies and action plans, set to be reviewed regularly. NDC will be reviewed in a participatory manner to reflect emerging needs, changes and decisions, particularly the outcome of COP21.

Solar panel in rural area.
Photo: Sitthipong Pengjan

Chapter Seven

CONCLUSIONS AND POLICY RECOMMENDATIONS

The analysis of African NDCs indicates that there is a significant range in the adaptation components proposed by each country in terms of actions and their estimated costs, and in terms of the need for local and international financial and non-financial support. The analysis reveals that adaptation and development in African countries are closely linked, particularly for sectors and subsectors identified as both vulnerable and a priority for immediate and long-term action. The vulnerabilities and priorities presented in the report emphasise the need for fundamental changes in the way adaptation is perceived and treated in finance agreements and proposals. This presents an important opportunity for achieving country-specific outcomes that ensure sustainable development in Africa.

NDCs can be more purposeful if their financial components are presented in a clear and actionable manner

To achieve the goals set for the different timeframes specified, there is a need for considerable financial resources. These could come from domestic sources, as well as from international support and from the private sector. It is evident that the costs proposed for meeting adaptation commitments are not sufficient to address the vulnerabilities identified and to build the required capacity.

However, because countries recognise the critical role that finance could play in delivering adaptation goals, it would be helpful for countries to propose comprehensive financing strategies that clearly determine conditionality as well stating the sources from which required resources can be mobilised. In other words, NDCs can be more purposeful if their financial components are presented in a clear and actionable manner, quantifying costs, specifying costing methodologies, and determining share of costs in relation to the sources identified. Putting stronger and clearer commitments at the fore will require a strengthened focus on institutional capacity as well as investment to open up access to adaptation finance.

RECOMMENDATIONS

The following recommendations are therefore critical:

1) **Build institutional capacity for adaptation action:** Climate adaptation action across Africa will only be sustainable if undertaken with strong institutional arrangements and supported by effective organisational networks. Institutions should have effective coordination mechanisms and be able to design and deliver climate actions through increased access to technical expertise.

   As all countries indicate a need for building capacity in their NDCs, countries and agencies seeking to provide support should strengthen the capacity of institutions to design, deliver, and monitor NDC-related projects and policies, partner with a network of other institutions, and engage relevant parties at multiple levels. Capacity-building can take the form of research support, establishment of MRV systems, development of implementation frameworks, and resource mobilisation.

2) **Climate adaptation polices and strategies must be carefully designed to link adaptation, mitigation and sustainable development goals.** It has been noted that some adaptation options can mitigate emissions in areas including agriculture, forestry and land use. Given the intimate connections between mitigation and adaptation it is therefore vital that adaptation strategies are designed to maximise synergies and co-benefits. Failed mitigation can lead to the need for adaptation, and failed adaptation leads to the need for compensation through a loss and damage mechanism. It follows from this that increasing investment in physical and social infrastructure in a carefully planned way is key to creating the conditions that will enhance the resilience and adaptive capacities of societies.

3) **African governments need to work hard individually and collectively on policies aimed at generating and sharing high quality data and information that can aid more effective climate adaptation in their jurisdictions.** The need for increased knowledge and information sharing at the country and regional level is a critical component in effective climate adaptation action in Africa. Currently, funding and action directed at this goal are grossly inadequate compared to need.

   Key areas where increased research is needed include: ecosystem-based adaptation; development of vulnerability maps and gathering of data on climate change impacts at sectoral and regional level; development of local adaptation scenarios; and analysis of the vulnerability of socio-economic sectors to climate change. A number of these areas might best be tackled at the continental level, but this will require better cooperation.

4) **National institutions and policies intended to deal with climate adaptation need to be strengthened to increase synergies between sectors and reduce silos and redundant overlaps.** Climate adaptation is a cross-sectoral issue and the most efficient and effective policies are those that recognise the multiple and often mutually interacting dimensions of climate change and their effects on human lives and the economy.

5) **Countries need to be prepared for local-level climate action: International support should be channelled towards translating NDCs into effective plans and projects.** With countries overwhelmingly requesting support for monitoring, mainstreaming, research, and technology development and transfer, there is an urgent need to break adaptation components in African NDCs down into manageable national development priorities and deliverables.

   This should be geared towards leveraging synergies for meeting the sustainable development objectives set out in the adaptation components of NDCs. It should improve access to quality data and technology, promote knowledge exchange through coordination mechanisms and strategic partnerships, and establish platforms for engagement and planning.

6) **Access to climate adaptation finance should be enhanced: Enhancements in institutional capacity and opportunities for designing and delivering robust measures for implementing NDC adaptation components will require financial support from various sources.** Countries should exploit all available means of support and engage their bilateral and multilateral partners to mobilise additional finance through existing climate finance mechanisms such as the Green Climate Fund. Ease of access, achieved through improvements in institutional capacity and the local knowledge base, is necessary for timely and focused climate adaptation actions.

Several of these recommendations require firm international commitment and support if they are to be accomplished. All African countries express support needs in the form of finance, capacity building, and technology development and transfer. Meeting these needs via international support would seem reasonable given Africa's low contribution and high vulnerability to climate change as well as the significant domestic finance that is already being committed to climate action by African countries.

The general analysis and the case country analysis in Chapter 6 provide a clear sense of the needs and priorities as well as the huge investment gap in adaptation in Africa. The primary premise in investing in adaptation action across the continent is that more support will create opportunities for African countries to leverage resources for mitigation while also enhancing the adaptive capacity of communities and countries.

This report offers a strong foundation for concrete and urgent efforts towards the mobilisation of finance and for understanding how funding could be most effectively and efficiently be channelled to help Africa improve the clarity and detail of the adaptation components in NDCs. It also provides a roadmap for directing future adaptation investments to African countries, as well as for guiding continued reflection on the broad purpose of adaptation in the context of country-level and regional commitments to address the impacts of climate change within the framework of the Paris Agreement.

Institutional partnerships like the Africa NDC Hub could benefit from the report by using it to: identify issues for implementing adaptation actions in NDCs; mainstream effective delivery processes; support countries in the design of bankable adaptation projects; and supporting national entities in resource mobilisation for project implementation. The report's findings and conclusions will enrich the roadmap proposed by the Africa NDC Hub in 2018 and shape the focus and depth of adaptation activities over the long term.

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ANNEXES

Annex 1: Countries that indicate goals for adaptation

COUNTRY	PLANNED ADAPTATION ACTIONS
Algeria	To create a national adaptation plan that prioritises protection of populations, preservation of natural resources and preservation of basic infrastructure against risks of extreme weather phenomena.
Benin	To achieve sectoral objectives for the time horizons 2020, 2025, and 2030 which are based on existing strategies, plans and programmes.
Botswana	To reduce climate change vulnerabilities.
Burkina Faso	Similar to the objectives set in the NAP (2014): 1) to reduce vulnerability to climate change impacts by developing adaptation and resilience capacities; 2) to facilitate the integration of adaptation to climate change in a coherent manner in policies, programmes or activities, new and existing, in particular planning process development and strategies in relevant sectors and at different levels.
Cameroon	To address the climate change concerns and achieve the vision to become an emerging economy by 2036.
Central African Republic	To support agriculture, food security, health, basic infrastructure and sustainable management of natural resources, with the aim of maintaining an annual rate of growth of agricultural activities of 6% and stabilisation of the rate of food insecurity at 15%.
Chad	To reinforce the capacities of the stakeholders (farmers, fishermen and livestock rearers) and their revenue-generating activities; improve e.g. crop production techniques; develop storage and conservation units to limit high post-harvest losses; inform, educate and communicate information relating to climate risk; create an observatory for policies for adapting to climate change; improve the seasonal forecast of precipitation and surface runoff and manage climate risks.
Comoros	To achieve qualitative and quantitative objectives for 2020 and 2030 in the water, agriculture and breeding, and health sectors, including to reduce risks and disasters, and build capacity for implementation (and mainstreaming) across different sectors.
Congo	To hasten modernization and industrialization of the country, which is in line with the Congo National Development Programme.
Cote d'Ivoire	To become an emerging country by 2020 and to achieve climate resilient development
Djibouti	To combat the impacts of climate change and to achieve economic and sustainable development by 2035 through a reduction of vulnerability to droughts, protection against sea level rise, improved water access, protection of biodiversity, and strengthened resilience of rural populations.
Ethiopia	To reduce vulnerability of livelihoods and landscapes and increase resilience
Ghana	To increase climate resilience and decrease vulnerability for enhanced sustainable development.
Guinea	To achieve sustainable economic development.
Kenya	To achieve a low-carbon and climate resilient development pathway by 2030.
Lesotho	To reduce and/or facilitate national resiliency against climate change shocks, especially production decline leading to food insecurity; rdeclining agricultural productivity, declining quantity and quality of drinking water; reduce environmental degradation; reduce erosion of basic support systems for majority of livelihoods.
Malawi	To promote climate change adaptation for sustainable livelihoods, while pursuing economic development that significantly reduces environmental risks and ecological scarcities.
Mali	To pursue a path of green economy and climate resilient development.
Mauritania	To reduce the vulnerability of natural and socio-economic systems to climate change.
Mauritius	To develop comprehensive action plans to facilitate adaptation to climate change
Morocco	To achieve adaptation priorities for the mountain regions, coast, oases, agricultural areas, and urban areas.
Namibia	To instil resilience to impacts of climate change in the most vulnerable sectors of the economy.
Niger	To contribute to Niger's sustainable development.
Nigeria	To reduce vulnerability to climate change impacts and increase resilience and sustainable wellbeing of all Nigerians; and to reduce or minimize risks by improving adaptive capacity, leveraging new opportunities, and facilitating collaboration.
Rwanda	To become a climate-resilient economy.
Sao Tome and Principe	To improve the country's ability to adapt to adverse consequences of climate change, thus contributing to sustainable national development.
Senegal	To mainstream climate change adaptation into national development planning.
Seychelles	To minimise the impacts of climate change through concerted and proactive action at all levels of society.
Sierra Leone	To reduce or minimize risks by improving adaptive capacity, reducing vulnerability to climate change impacts and increasing the resilience and sustainable wellbeing of all citizens.
Somalia	To reverse deforestation and land degradation, through a range of remedial actions
South Africa	To guide the country's sustainable development trajectory where poverty is eliminated, and inequalities are reduced by 2030.
Sudan	To contribute to sustainable development and reduce poverty by reducing long-term negative impacts of climate change.
Tanzania, United Republic of	To embark on a climate-resilient development pathway, reduce climate-related disasters from 70% to 50%, and reduce the impacts of spatial and temporal variability of declining rainfall, frequent droughts and floods which have implications for all productive sectors and ecosystems, particularly the agricultural sector.
Togo	To reinforce the resilience of the country's production systems and means.
Uganda	To reduce vulnerability and address adaptation in agriculture and livestock, forestry, infrastructure (with an emphasis on human settlements, social infrastructure and transport), water, energy, health and disaster risk management.
Zambia	To enhance the resilience of its population, ecosystems, infrastructure, productive and health systems.
Zimbabwe	To upscale national planning and implementation of adaptation actions that enhance resilience of all sensitive socio-economic sectors to improve the national adaptive capacity.

Annex 2: Countries that include adaptation goals for the agriculture sector

COUNTRY	PLANNED ADAPTATION ACTIONS
Algeria	To integrate the impacts of climate change into sectorial strategies, in particular to increase the resilience of ecosystems and agricultural systems.
Benin	To ensure the diversification and promotion of high value-added agricultural value chains, as well as the modernization of resilient agricultural infrastructure in the context of climate change, to promote climate resilient agricultural production systems for food and nutrition security ('Smart Agriculture facing the climate'), to define new agricultural calendars adapted to a changing climate (goals until 2020).
Botswana	To improve genetic characteristics of the livestock breed such as Musi breed; to improve livestock diet through supplementary feeding; to switch to crops with the following traits: drought resistant, tolerant to high temperatures, having short maturity.
Burkina Faso	To promote SLM; to cultivate early or drought-resistant varieties; to implement water and soil conservation techniques; to practice integrated soil fertility management; to move resolutely toward sustainable and adapted agricultural practices, particularly for family operations and small producers.
Burundi	To increase agricultural production and productivity and develop sustainable production systems that can re-establish food self-sufficiency in the short and medium terms; to develop capacity in the agricultural sector in order to transform subsistence farming into profitable market agriculture managed by professionals.
Cameroon	To develop an integrated and resilient agriculture in the face of the effects of climate change through spatial planning, choice of agronomic techniques and intensification.
Cape Verde	To promote integrated water resources management, guaranteeing stable and adequate water supply for consumption, agriculture, ecosystems and tourism; to increase adaptive capacities of agro-silvopastoral production systems in order to ensure and improve national food production.
Central African Republic	To introduce varieties that are adapted to climate extremes; to diversify agricultural systems by including several types of crops and diversifying varieties; to diversify means of livelihood and systems of production (fishing, aquaculture, agriculture, animal husbandry, hunting and forests); to sustainably manage transhumance corridors and conflicts between agriculturalists and pastoralists; to promote agricultural and forestry systems and sustainable soil management.
Chad	To promote water-efficient and intensive agriculture; to use improved inputs (organic fertilizers including composts, adapted plant varieties); to develop renewable energies for the agriculture sector; to improve access to agriculture production; to reinforce cloud-seeding operation to compensate for rainfall deficit in agriculture.
Comoros	To reduce the vulnerability of agricultural systems; to ensure that 100 % of farmers use water management systems, technologies and varieties that are adapted to climate change.
Congo	To facilitate the transfer of technology and promote agriculture in savannah areas through mechanisation.
Congo, the Democratic Republic of the	To improve agro-ecological production practices; to strengthen the resilience of communities to climate change through the implementation of coastal erosion control measures, the establishment of an early warning system and the diversification of income-generating activities for vulnerable communities in agriculture.
Ethiopia	To increase resilient agriculture by reducing vulnerability to floods and droughts; increase agricultural productivity; minimize food insecurity; and increase incomes irrespective of climate change by breeding and making available improved crop varieties.
Gambia	To strengthen diversified and sustainable livelihood strategies for reducing the impacts of climate variability and change in agriculture; to mainstream national adaptation strategies into national agriculture policies; to promote value addition of products to complement and support crop diversification; to improve agro-climatic monitoring and early warning for food security; to promote climate information services to the agriculture sector and for dissemination to rural communities; to enable sustainable crop intensification by introducing innovative crop improvement and management practices.
Ghana	To build agriculture resilience in climate-vulnerable landscapes; to promote innovations in post-harvest storage and food processing and forest products in 43 administrative districts; to scale up penetration of climate-smart technologies to increase livestock and fisheries productivity by 10%; to modify community-based conservation agriculture adopted in 43 administrative districts.
Guinea	To develop agro-ecological fish-farming techniques; use low-input varieties and cropping techniques suited to a drier climate; develop hydro-agricultural schemes; develop techniques to conserve and process agricultural, forestry and fish-farming products.
Kenya	To enhance the resilience of the agriculture, livestock and fisheries value chains by promoting climate-smart agriculture and livestock development.
Madagascar	To develop Resilient Agriculture Integrated Model pilot projects/programmes (combination of watershed management, selected/adapted varieties, locally-produced compost, rehabilitation of hydro-agricultural infrastructures, input access facilitation until 2020; to apply cyclone-resistant hydro-agricultural infrastructures standards system, conservation agriculture, and agroforestry) or 'climate-smart agriculture' until 2020; to promote intensive/improved rice farming systems and rain-fed rice farming techniques until 2020; to effectively implement multi-hazard early warning systems for food security until 2030.
Malawi	To increase irrigation at smallholder level; to increase land under irrigation through Greenbelt initiative from 20000 to 40000 hectares; to expand programmes of Greenbelt initiative from 40000 hectares to 10000 ha by 2030; to build adaptation capacity in climate-resilient agronomic practices for smallholder farmers; to promote on-farm water conservation technologies; to support an expanded programme of constructing multipurpose dams for irrigation and aquaculture; to develop financial mechanisms to support crop insurance targeting smallholder farmers etc.
Mali	To promote a sustainable, smart and competitive agriculture that relies primarily on family businesses; to set up hydro-agriculture in 92 000 hectares in the context of sustainable land management.
Mauritius	To promote climate smart agriculture practices.

COUNTRY	PLANNED ADAPTATION ACTIONS
Morocco	To switch from current irrigation systems to localized irrigation systems over an area of 550,000 hectares, for USD 3.7 billion until 2020; to develop public-private partnerships to to deliver irrigation services; to build hydro-agricultural infrastructure around dams in over 160,000 hectares at a cost of USD 2.1 billion until 2020; to cover risk against climatic variations through multi-risk insurance for cereals and legumes covering 1 million hectares until 2020; to extend irrigation to new agricultural areas, in over 260,000 hectares for an overall investment of USD 3 billion until 2030; to equip and modernize irrigation systems in over 290,000 hectares for an overall forecasted cost of USD 2 billion until 2030.
Namibia	To promote better-adapted crop varieties; to promote Climate Smart Agriculture and Conservation Agriculture & Urban and peri-urban agriculture.
Niger	To improve resilience in the agricultural sector.
Nigeria	To adopt improved agricultural systems for both crops and livestock (for example, diversify livestock and improve range management; increase access to drought-resistant crops and livestock feeds; adopt better soil management practices; and provide early warning/ meteorological forecasts and related information); to implement strategies for improved resource management (for example, increased use of irrigation systems that use low amounts of water; increase rainwater and sustainable ground water harvesting for use in agriculture; increase planting of native vegetation cover an d promotion of re-greening efforts; and intensify crop and livestock production in place of slash and burn).
Rwanda	To mainstream agro-ecology techniques using spatial plant stacking as in agroforestry, kitchen gardens, nutrient recycling, and water conservation to maximise sustainable food production; to implement agroforestry sustainable food production by 2030 in 100% of the households involved in agriculture production; to use fertiliser-enriched compost; to mainstream sustainable pest management techniques that incorporate a cropping system based on producing multiple crop and fodder yields to control plant parasites and pathogens; implement an intensive agroforestry programme with a target of covering 100% of arable land by 2030 etc.
Sao Tome and Principe	To develop a national program for sustainable management of the forest and agroforestry ecosystems by 2025; to develop scientific and technical research on adaptation of new productive crop varieties with a broad spectrum of tolerance to adverse climate impacts by 2030 etc.
Seychelles	To increase resilience through a sustainable modern agriculture supported by new and innovative technologies across all food production supply and value chains, and by skilled and qualified human resources and integrated with the Blue Economy and Seychelles Strategic Plan 2015; to revitalise extension services and provide opportunities to study climate-smart and ecosystem-based approaches to agriculture and fisheries etc.

COUNTRY	PLANNED ADAPTATION ACTIONS
Sierra Leone	To manage crops and livestock in an integrated manner.
Somalia	To engage climate-vulnerable pastoralists and farmers and other key stakeholders (i.e. clan elders) in the formulation of local and district development plans focused on tenure, governance and land use management; to introduce integrated land use management (rangeland, reforestation, agro-forestry and watershed management) planning principles to district and community stakeholders; to rehabilitate and reinstate degraded ecosystems, in particular rangeland areas, forests and areas with a high potential for cultivation; to provide sustainable grazing, forestry products, and agriculturally productive zones etc.
Sudan	To diversify crops and introduce improved drought-resistant varieties/early-maturing varieties (both field and horticultural crops) in areas affected by rainfall decrease/ variability; to rehabilitate meteorological networks to enhance early warning system activities, to diversify income-generating activities in order to increase adaptive capacity of vulnerable farmers etc.
Togo	To promote efficient varieties resistant to climate change; to strengthen Integrated Soil Fertility Management (ISFM); to map out and establish transhumance zones and corridors; to construct and/or improve reservoirs for micro-irrigation and livestock watering in rural areas throughout all regions; to support the mapping of agricultural areas vulnerable to climate change; to support the dissemination of good agro-ecological practices etc.
Tunisia	To adapt irrigated crops in the central regions; to adapt mixed farming-livestock production to climate change in vulnerable regions; to update a climate monitoring and early warning system, as well as an insurance mechanism against climatic hazards due to climate change etc.
Uganda	To expand extension services; to expand climate information and early warning systems; to expand Climate Smart Agriculture; to expand diversification of crops and livestock; to expand value addition, post-harvest handling and storage and access to markets, including micro-finances; to expand research on climate resilient crops and animal breeds etc.
Zambia	To promote CSA practices through conservation agriculture, agroforestry, use of drought tolerant varieties, water use efficient management and fertilizer use efficient management.
Zimbabwe	To promote adapted crop and livestock development and climate smart agricultural practices through the following interventions: to strengthen capacities to generate new forms of empirical knowledge, technologies (including conservation agriculture) and agricultural support services that meet climate challenges; to promote the use of indigenous and scientific knowledge on drought tolerant crop types and varieties and indigenous livestock that are resilient to changes in temperatures and rainfall; to develop frameworks for sustainable intensification and commercialization of agriculture at different scales across agro ecologies; to strengthen early warning systems on climate related agricultural risks etc

Annex 3: Countries that include goals for the water sector

COUNTRY	PLANNED ADAPTATION ACTIONS
Algeria	To integrate the impacts of climate change into sectorial strategies, in particular for water management
Benin	To reinforce the availability of water in the disadvantaged zones in order to allow people to adapt to climate change, and to promote water efficiency by 2020; reduce the vulnerability of natural and human systems towards water stress, floods and the degradation of water quality, to promote good water governance, as well as to strengthen knowledge about the climate system and the means to generate climate and hydrological information and about the prediction of climatic hazards by 2030
Cape Verde	To promote integrated water resources management guaranteeing stable and adequate water supply
Central African Republic	To improve the supply of potable water, to establish a system for monitoring water quality, and to develop a system for monitoring underground and surface water resources
Comoros	To reduce the risks associated with climate change for everyday life and the impacts on the water resources; ensure that 66% of the population has access to drinking water by 2020 and 100% has access to drinking water by 2030
Morocco	To substitute water supplies from overexploited groundwater tables (85million m3 annually) with above-ground water sources and the artificial replenishment of groundwater tables by up to 180 million m3/year by 2020; and to construct three dams per year on average in order to reach 25 billion m3 in stocking capacity and to desalinate seawater to reach a capacity of 500million m3 per year by 2030

Annex 4: Countries that identify vulnerabilities in their NDCs

COUNTRY	PLANNED ADAPTATION ACTIONS
Algeria	Drought, desertification, flooding, which leads to vulnerability of farming and loss of human lives
Benin	Climate change impacts on agriculture, water resources, human health, forestry and the coastal zone
Botswana	Extreme weather events, droughts and floods
Burkina Faso	More difficult and dry seasons, seasons with more heavy rain, drought, and increase in certain diseases
Cameroon	Climate change impacts on agriculture, water management and health
Cape Verde	Sea level rise; 80% of population lives in coastal areas; negative effects from increased frequency and intensity of floods, droughts and storms, and a shorter rainy season
Central African Republic	Extreme hazards (torrential rains, floods and drought); most vulnerable areas are the South, North and Northeast and most vulnerable populations are women, children, indigenous peoples and the aged, i.e. around 75% of the population
Chad	Climate change impacts on the large hydrographic systems of the basins of Lakes Chad and Niger, i.e. natural, agro-silvo-pastoral, fishery and human systems. They include changes to the agricultural seasons, disturbances in the biological cycles of crops and a reduction in cereal crop production
Comoros	Climate change impacts such as the raise in temperature and sea level, modification in rain pattern, modification in wind patterns, acidification of oceans, etc. Rural communities and poor farmers are vulnerable
Cote d'Ivoire	Climate change impacts that affect essential sectors and the country's development. 11 vulnerable sectors are listed: agriculture, land use forests, fisheries, water, transport, etc
Djibouti	Climate change impacts on biodiversity and arable land, marine ecosystems, water access, financial and human losses
Egypt	Climate change impacts on water resources (particularly the Nile); the agricultural sector, coastal zones, tourism sector, national heritage and energy sector
Ethiopia	Climate change impacts on all geographic areas; the most vulnerable sectors include health, agriculture, water, energy, buildings and transport
Gambia	Many threats induced by climate change (NDC states that Gambia is very vulnerable)
Guinea	Climate change impacts on the sectors agriculture/cattle breeding, water the coastal zone and forestry. The country also identifies certain vulnerable groups of population
Kenya	Climate change impacts in the context of poverty, geographic location, economic dependency on climate-sensitive sectors; socio-economic losses, mainly due to floods and droughts (account for 3% of the country's GDP)
Lesotho	Climate variability and extremes which are expected to increase in frequency and intensity in the future. A sectoral vulnerability assessment to climate change was carried out on key sectors: agriculture, water resources, forestry, rangelands, and health
Malawi	Major climate related hazards floods and droughts (one of the most vulnerable countries in sub-Saharan Africa)
Mali	Various natural risks related to climate change: recurring droughts, inundations, strong winds, bushfires, changing rainfall pattern causing uncertain situation for agricultural calendar; agriculture represents 45% of the GNP, 80% of the active population works in agriculture and is very sensitive to climate change
Mauritania	Desertification; expected climate change impacts are described in detail for different sectors
Morocco	Water scarcity (trough reduction in precipitation, temperature increase); declining agricultural production; desertification; flooding and rising sea levels etc
Namibia	Temperature rise, droughts, floods, which pose risks for agriculture, fishery, water security, ecosystems, infrastructure, tourism; the population dependent on subsistence farming is especially vulnerable.
Niger	Changes in precipitation, elevated temperatures, droughts, flooding, hard winds, sand storms and water access
Nigeria	Climate change impacts on the overall economy and particular sectors such as agriculture and food security, water, floods and drought, soil erosion, sea level rise, energy, tourism, and ecosystems
Rwanda	Climate change impacts in the context of strong reliance on rain-fed agriculture
Sao Tome and Principe	Sea level rise (small island state), longer dry seasons; worst affected sectors include energy production, fishery, agriculture and forestry

COUNTRY	PLANNED ADAPTATION ACTIONS
Senegal	Climate change impacts that affect biophysical and socio-economic systems; a list of priority sectors is included
Seychelles	Climate change impacts on critical infrastructure, tourism, food security, coastal and marine resources, water security, energy security, health, waste, disaster preparedness and biodiversity
Sierra Leone	Climate change impacts (3rd most vulnerable country in the world)
Somalia	Natural disasters such as droughts and floods, partly because of the effects on deforestation and desertification; political instability as well as charcoal export are factors that exacerbate the situation
South Africa	Climate change impacts on water and food security, health, human settlements, and infrastructure and ecosystem services
Sudan	Climate change impacts in the following most vulnerable sectors: agriculture, water resources; coastal zones and public health
Swaziland	Storms and droughts that lead to crop loss, ecosystem loss, and negative health effects
Tanzania, United Republic of	Climate change impacts that are affecting coastal zones, public health, energy supply and demand, infrastructure, water resources, agricultural production and availability of ecosystem goods and services
Tunisia	Climate change impacts on 6 key sectors and ecosystems which are among the most vulnerable in the world (one of the countries most exposed to climate change in the Mediterranean)
Uganda	Changing weather patterns, low water levels, and increased frequency of extreme weather events that mostly affect agriculture, water, health and human settlements; especially vulnerable groups include women, children, the rural poor, the elderly and the disabled
Zambia	Droughts and floods that affect food and water security, water quality and energy security
Zimbabwe	Temperature increase, water stress and flooding; agriculture is particularly vulnerable; 80% of the rural population is dependent on rain fed agriculture; other sectors under threat include fishery, tourism and energy

Annex 5: Countries that include planned actions for adaptation

COUNTRY	PLANNED ADAPTATION ACTIONS
Algeria	Strengthen resilience of ecosystems, fight against erosion and rehabilitation of degraded land, integrate climate change effects into sectorial strategies, and integrate climate change effects in political stability and national security.
Benin	Develop and implement measures in e.g. agriculture and food security, renewable energy, water access, health, coastal zone protection, adaptation mainstreaming, observation and early warning systems.
Botswana	Mainstream adaptation measures into national development plans; develop the National Action Plan and Action Plan which will highlight all the priority areas including Climate Smart Agriculture.
Burkina Faso	Implement adaptation projects in the following areas: agriculture/water, cattle-breeding, biomass sector, forests and land use change, urban planning and housing sector, health sectors. Many projects have quantified goals.
Cameroon	Implement an action plan for 2016-2020 (developed on the basis of the intervention strategy 2016-2025), covering the following areas: agriculture, breeding, fisheries, land settlement (planning)/risk management, energy/industry, forests, water management/ health/social, strengthening of capacities/communication.
Cape Verde	Implement adaptation action in key strategic sectors: water and sanitation, agriculture, coastal habitats.
Central African Republic	Implement priority activities in the following sectors: agriculture and food security, forestry, energy, public health, water resources and land-use planning. 15 prospective adaptation measures have been identified as preconditions for developing the National Adaptation Plan.
Congo	Develop and implement adaptation actions in most vulnerable sectors (hydrology and water resources, energy, agriculture, forest, health) according to natural zones (e.g. coast, urban zones, etc), present what is being done and request to finance additional activities in the context of the mitigation-adaptation relevant Low carbon Strategy 2015-2025.
Cote d'Ivoire	Implement actions to reduce vulnerability and increase resilience in the area of water resources, agriculture, forests and land use, management of hydro meteorological catastrophes.
Egypt	Implement action to promote resilience in the sectors of water resource management; agricultural security and coastal zones management and develop additional adaptation policies and measures. Further actions are listed in the section Adaptation Action Packages for the sectors of coastal zones; water resources and irrigation; agricultural sector; health sector; rural areas, population and roads; tourism sector; and energy.
Ethiopia	Focus on actions to increase resilience and reduce vulnerability of livelihoods and landscapes with measures related to drought, floods and other cross-cutting interventions.
Gambia	Implement actions in priority sectors: agriculture, energy, water resources, waste management (10 exemplary actions are listed); continue mainstreaming adaptation in development planning across sectors.
Ghana	Implement 11 adaptation programmes of actions in 7 priority sectors (agriculture, forestry, infrastructure/built environment, health, water resources, gender and the vulnerable).
Guinea	Implement a number of actions to: 1) preserve quality and quantity of water resources; 2) put in place necessary measures to protect, conserve and manage ecosystems, revitalisation of economic activities, and strengthening of resilience of coastal populations; 3) accompany the adaptation efforts and rural communities to develop e.g. agricultural techniques that enable to continue activities and to preserve the resources which they rely on.

COUNTRY	PLANNED ADAPTATION ACTIONS
Kenya	Finalise the NAP process and implement a comprehensive set of priority adaptation actions in different sectors by 2030.
Lesotho	Implement current and planned actions until 2022, in following domains: crop production and cropping systems, livestock production and livestock systems, forest and land rehabilitation program, wetlands and watershed management, climate change adaptation projects.
Madagascar	Finalise and implement the NAP; mainstream climate change into all sectors. Other areas include an early warning system; agriculture resilience; marine policy; water resources management; health; forest management; meteorological services; awareness promotion (priorities before 2020); enhance information monitoring; implement early warning systems; strengthen agriculture resilience, natural protection, water resources management, food security. Implement adaptation action in the health sector (priorities after 2020).
Malawi	Implement sector-specific policies which have mainstreamed adaptation activities and implementation frameworks; adaptation fields and ongoing/planned activities are mentioned for 8 sectors and gender issues.
Mali	Achieve targets for 2015-2020 (qualitative and quantitative) according to three categories: programmes presented at climate summit in 2014. NAPA (National Adaptation Programme of Action) and other projects.
Mauritius	Implement adaptation action in areas such as infrastructure, disaster risk reduction strategy, coastal zone management, water resource management, rainwater harvesting, desalination, integrated pest and disease management, efficient irrigation technique development, climate smart fisheries, marine and terrestrial biodiversity resilience, health sector, transportation.
Morocco	Finalise drafting of the NAP document (the NAP process has started). Clear, quantified sectorial policy targets for 2020 and 2030 are set.
Namibia	Finalise NAP development; 6 areas and 18 intended actions are listed.
Niger	Implement adaptation action related to AFOLU (agriculture, forestry and other land uses) (2015-2030) and energy (transport, residential, and energy industry, up to 2050) sectors.
Nigeria	Implement 13 sector-specific strategies, policies, programmes and measures in hec areas of: agriculture, freshwater resources, coastal and water resources and fisheries, forests, biodiversity, health and sanitation, human settlements and housing, energy, transportation and communications, industry and commerce, disaster, migration and security, livelihoods, vulnerable groups, education. Nigeria highlights strategies for high-emitting sectors, including measures that will integrate adaptation into national and sectoral planning.

COUNTRY	PLANNED ADAPTATION ACTIONS
Rwanda	Achieve energy security and a low carbon energy supply that supports the development of green industry and services; sustainable land use and water resource management that result in food security, appropriate urban development and preservation of biodiversity and ecosystem services, as well as to ensuring social protection, improved health and disaster risk reduction that reduces vulnerability to climate change impacts. The country plans to; undertake measures on the prevention of losses; bring mainstream agro-ecology technologies in its current agriculture intensification programme; promote sustainable pest management techniques that incorporate a cropping system; and establish a comprehensive National Water Security Plan.
Seychelles	Mainstream adaptation planning into national development planning which includes all sectoral plans. Main actions are to increase resilience and reduce vulnerability of livelihoods and island life with respect to critical infrastructure, tourism, food security coastal and marine resources, energy security and health.
Sierra Leone	Mainstream green growth into national development process; the Action Plan includes (a) prioritised activities that will support Sierra Leone to transition to a low-carbon and climate-resilient economy; (b) information on financing the NDC; (c) mobilisation of resources and (d) monitoring, reporting and verification of impacts on the citizens and economy of Sierra Leone due to the implementation of the strategy and action plan; climate change adaptation consists of 12 strategies.
Somalia	Implement 9 project plans of which at least 6 can be judged to include adaptation. These are: sustainable land management to build resilient rural livelihoods and enable national food security, adaptation using integrated land resources management to ensure water access and supply to vulnerable populations and sectors, adaptation by reducing risks among vulnerable populations from natural disasters; rehabilitation of a hydro-electric dam and hydro-infrastructure; domestication of indigenous and the introduction of economically important plant species; and marine and coastal environmental governance and management.
South Africa	Achieve 6 specific adaptation targets: 1) Develop a National Adaptation Plan and begin operationalisation as part of implementing the National Climate Change Response Policy (NCCRP) for the period 2020-2025 and for the period 2025-2030; 2) Take into account climate considerations in national development, sub-national and sector policy frameworks for the period 2020 to 2030; 3) Build the necessary institutional capacity for climate change response planning and implementation for the period 2020-2030; 4) Develop an early warning, vulnerability and adaptation monitoring system for key climate vulnerable sectors and geographic areas for the period 2020-2030, and reporting in terms of the National Adaptation Plan with rolling five year implementation periods; 5) Development of a vulnerability assessment and adaptation needs framework by 2020 to support a continuous presentation of adaptation needs; 6) Communication of past investments in adaptation for education and awareness as well as for international recognition.

COUNTRY	PLANNED ADAPTATION ACTIONS
Sudan	Implement adaptation action in priority sectors: agriculture (crop production, rangeland and livestock); water; coastal zones; and health. Sudan is in final stage of developing its NAP. Mainstreaming adaptation and enhancing adaptive capacity is planned.
Tanzania, United Republic of	Undertake qualitative actions in the following sectors: agriculture, livestock, forestry, energy, coastal, marine environment and fisheries, water resources, tourism, human settlements and health.
Tunisia	Undertake measures focusing on adaptation in six sectors mentioned in the section (A) of the INDC.
Uganda	Achieve qualitative targets in six priority sectors: agriculture, forestry, water, infrastructure, energy, health, and risk management; develop the NAP and mainstream climate resilience across sectors.
Zambia	Finalise the NAP; mainstream adaptation; implement adaptation action in seven key sectors: agriculture, water, forestry, energy, wildlife, infrastructure, health. Three programs and 11 priority actions are listed in the NDC.
Zimbabwe	Develop the NAP; and mainstream adaptation across sectors, especially agriculture.

Annex 6: Countries that identify current and future adaptation support requirements

COUNTRY	CURRENT AND FUTURE ADAPTATION SUPPORT ACTIONS
Algeria	Current bilateral and multilateral support must continue, as well as new external financial resources; technology transfer and capacity building also needed.
Benin	Future requirements in technology transfer, capacity building and finance.
Burkina Faso	Lists costs of projects planned. External support needed from bilateral donors, GCF, private sector etc.
Cameroon	Foresees financing from a number of different sources, e.g. national budget, GCF, private financing, and carbon market. Capacity strengthening, technology transfer and knowledge sharing needed.
Cape Verde	Call for support in form of technology transfer, capacity-building, business development, private-sector involvement, and international climate finance.
Central African Republic	Financial support needed; 1.554 billion USD over the period of commitment, 1.441USD of which is conditional.
Chad	Mentions current funding; e.g. By 2030, total necessary funding to implement the NDC adaptation component would be 14.170 billion USD. Needs include reinforcement of capacities, financial support and technology transfer.
Comoros	All adaptation projects are financed by external agencies. Needs include finance (300 million USD for adaptation), technology transfer and capacity building.
Congo	Needs finance – 14 billion EUR of investment necessary for mitigation and adaptation activities. Request for international support is equal to total amount.

COUNTRY	CURRENT AND FUTURE ADAPTATION SUPPORTACTIONS
Cote d'Ivoire	Needs to build human, institutional, technical, financial resources and enhance technology transfer. Needs international financial resources to complement national budget to finance measures in the NDC. Different types of financing entities mentioned, e.g. GCF, private finance, carbon markets, donors/loans and technical assistance grants.
Djibouti	Needs financial support, capacity building and technology.
Egypt	Needs international support, estimated at 73.04 billion USD for both mitigation and adaptation for the period until 2020 and 2030 respectively. Further support for capacity building and technology transfer is needed.
Gabon	Needs financial support to establish a National Fund for Sustainable Development.
Gambia	Needs financial support to undertake capacity building and technology transfer.
Ghana	8.29 billion USD financial support needed; technology and technical capacity also needed.
Guinea	Additional external financial resources needed to complement national resources available and fill the current funding gap.
Kenya	Conditional support requirements are mentioned. Needs financial support to facilitate capacity building and technology development and transfer.
Lesotho	Urgent need for finance, capacity building and technology transfer; underscores need for research support in climate change adaptation.
Madagascar	Needs external (financial) support; looking to contribute 4% of estimated costs
Malawi	Request for financial support, capacity building and technology transfer; support requested has been specified for each activity.
Mali	Needs 1,062 billion USD for the financing of 5 big adaptation-based programmes that were presented at the 2014 climate summit. Also needs 12,624 billion USD to replicate the 5 programmes and undertake other actions aiming at ensuring sustainable national development.
Mauritania	Needs 9.4 billion USD international support for adaptation; costs have been estimated for each sector.
Mauritius	Needs 4 billion USD to support adaptation measures in form of finance, investment, technology development and transfer, and capacity building.
Morocco	Need for support in the areas of financial resources, technical and institutional capacity building, legal advice and monitoring and evaluation.
Namibia	Need for capacity building and technology transfer.
Niger	Need for financial support (87% of costs of NDC are required from new sources of financing, such as the GCF) to leverage 13% domestic funds committed. Technology transfer and capacity building also needed.
Nigeria	Finance, technology and capacity building needed to achieve commitments. Unclear whether these needs also relate to adaptation actions.

COUNTRY	PLANNED ADAPTATION ACTIONS
Rwanda	Requires 24.15 billion USD to implement Green Growth and Climate Resilient Strategy. Full implementation of this strategy rests upon five enabling pillars: institutional arrangements (integrated planning and data management); finance; capacity building and knowledge management; and technology, innovation and infrastructure.
Seychelles	Financial needs to complement current support of 2 million EUR. from the Global Climate Change Fund to implement National Climate Change Strategy.
Sierra Leone	International support required in the form of financial resources, technology transfer and capacity building. Overall financial requirement for CC is 900 million USD.
Somalia	Financial support needed to implement project plans.
South Africa	Country seeks recognition of its national investments in adaptation as part of its relative fair global effort. International support not explicitly mentioned.
Sudan	Overall investments (required) estimated in terms of finance, technology and capacity building are 1.2 billion USD.
Tanzania, United Republic of	Request for adequate and predictable financial and technological support from the international community. No concrete figures for adaptation mentioned.
Togo	1.54 billion USD required to implement adaptation activities
Uganda	Call for financial support: 70% adaptation implementation in the next 15 years conditional on external financial support. Need for capacity building and technology transfer also mentioned.
Zambia	Repeated requests for financial support: 35 billion USD requested for action on mitigation and adaptation.
Zimbabwe	26.175 billion USD required by 2030 under to address various needs including capacity building and technology transfer.

ANALYSIS OF ADAPTATION COMPONENTS OF AFRICAN NATIONALLY DETERMINED CONTRIBUTIONS (NDCS)