



Adaptation Finance Flows in Africa

KEY MESSAGES

- Africa faces a serious and urgent shortfall in funding for climate adaptation, even as the costs of delayed action rise.
- Cumulative analysis of the Nationally Determined Contributions (NDCs) of 51 African countries shows a need for an estimated US\$579 billion in funding for adaptation through 2030. But this would require an annual outlay much larger than the US\$11.4 billion in tracked adaptation finance to Africa on average annually in 2019 and 2020.
- Most of the funding for adaptation presently comes from the public sector. To tap a wide range of potential actors, it is necessary to build an enabling environment for adaptation investment and aggressively deploy innovative finance instruments at scale toward adaptation activities.



Photo: Sven Torfinn/Panos Pictures

- A number of case studies focused on adaptation and funding strategies in Rwanda, Ghana, Kenya and Egypt offer insights into best practices that, given the right context, can be modeled in other African countries.

“

We are, at this moment, spending more than half of our public climate budget on adaptation and resilience—and the vast majority of the spending is now geared towards Africa, and rightly so.”

H.E. Mark Rutte
Prime Minister of the Netherlands

INTRODUCTION

Current adaptation finance flows in Africa are insufficient to meet the growing adaptation needs on the continent.¹ This chapter provides an overview of existing adaptation finance flows in Africa and identifies opportunities to increase the volume and efficacy of that finance. The core objectives of this chapter are to:

- Assess the state of adaptation finance and risk-finance mechanisms already available and in use in Africa.
- Analyze African financial market readiness for climate adaptation finance and risk-finance mechanisms.
- Present three country case studies to illustrate facets of the adaptation finance landscape in Africa, respectively covering country-level adaptation finance needs, domestic public finance to adaptation, and the issuance of sovereign bonds.
- Identify gaps where climate risk exists yet there is insufficient finance to address it, as well as the barriers to implementation.
- Propose solutions to increase the volume and variety of capital available for adaptation finance and risk-transfer mechanisms in Africa and to enable pipelines for adaptation and dual-benefits projects in the region.

FINANCIAL FLOWS ANALYSIS

The impacts of climate change in Africa are being exacerbated by rapid urbanization, geopolitical tensions, and the impact of global shocks such as the COVID-19 pandemic and the ongoing war in Ukraine. Rising prices of energy, food, and other commodities have worsened the climate-related food security and energy access risks to the population of Africa. Despite these challenges, there is a significant opportunity for climate investments in Africa to mainstream resilience and low-carbon development in the long term.

In September 2022, the analysis and advisory organization Climate Policy Initiative (CPI) released *The Landscape of Climate Finance in Africa*, a comprehensive exercise to map climate mitigation and adaptation investments in Africa. The analysis indicates that an annual average of US\$29.5 billion in climate finance was committed to Africa in the years 2019 and 2020.² Approximately 39 percent of those

commitments, amounting to US\$11.4 billion, targeted adaptation activities.

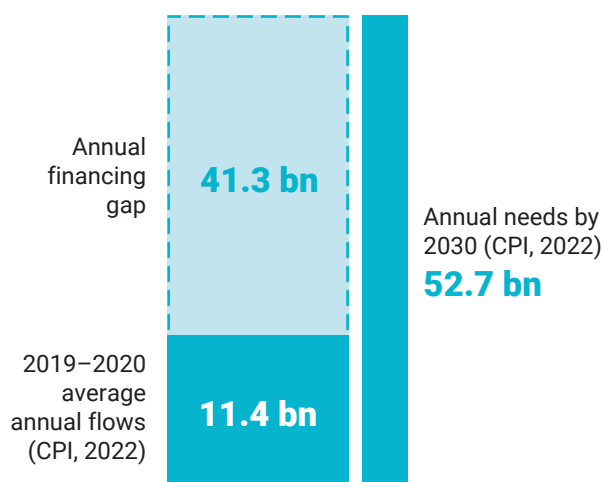
Importantly, the newly assessed commitments for 2019–2020 in the CPI report represent a 44 percent increase from the US\$7.9 billion reported by CPI's 2021 *Global Landscape of Climate Finance* as adaptation finance in Africa for the same two years. CPI continually strives to enhance the tracking of climate finance by both updating data inputs as new information becomes available and by adding new data sources to address data gaps, which are especially pervasive in adaptation finance. The 2022 *Landscape of Climate Finance in Africa* study—the first of its kind—represents an especially concentrated effort to improve data availability and quality for Africa, leading to a relatively large difference between the commitments for 2019–2020 reported in 2021 as compared to those reported in 2022 for the same years.

The increase in the 2022 analysis is primarily attributable to 1) updated investment data for 2020 made available in April 2022 by the OECD Creditor Reporting System (CRS);³ 2) new inclusion of adaptation activities from publicly available resources on African national government budget expenditures like climate budget tagging (CBT) and Climate Public Expenditure and Institutional Reviews (CPEIRs); 3) updated OECD statistics on the amounts mobilized from the private sector by official development finance interventions; and 4) screening of post-issuance reporting on climate bonds in African countries.⁴

Figure 1 shows the trends in adaptation financing flows and needs in Africa. It is informed by an analysis of the Nationally Determined Contributions, or NDCs, submitted by African countries that provide information on countries' climate finance needs. Of 53 African countries that submitted NDCs, 51 countries (collectively representing more than 93 percent of Africa's GDP) have also provided data on the costs of implementing their NDCs.

The analysis of that data indicates an estimated US\$579.2 billion in adaptation finance needs for Africa over the period 2020–2030.^{5,6} By contrast, as already noted, an annual average of US\$11.4 billion was tracked in adaptation finance to Africa in 2019–2020. If this trend were to continue through 2030, adaptation finance would total US\$125.4 billion

Figure 1. Adaptation Finance Commitments (US\$bn) vs. Needs in Africa



through 2030, far short of the US\$579.2 billion (or approximately US\$52.7 billion annually) in estimated needs per costs of implementation stated in NDCs. Adaptation finance is thus scaling too slowly to close the investment gap, even as the costs of inaction rise.⁷

Adaptation finance was approximately 39 percent of total tracked climate finance to Africa in 2019–2020. Further, the share of adaptation finance as a percentage of total climate finance was higher in Africa than any other region for 2019–2020.⁸ Due to the cross-sectoral nature of adaptation projects, a large share of tracked adaptation finance commitments to Africa in 2019–2020 went toward cross-sectoral activities (41 percent, US\$4.7 billion), which included support for national-level policy and capacity building, disaster management activities, COVID-19 response, urban issues, and social security.⁹ The agriculture, forestry, and other land use (AFOLU) sector saw the second-highest commitments, accounting for US\$2.8 billion, followed by the water and wastewater sector with US\$1.7 billion in annual commitments.

Across Africa, multilateral development finance institutions (DFIs) were the most significant source of adaptation finance flows (53 percent, US\$6 billion), followed by governments (23 percent, US\$2.6 billion) and bilateral DFIs (16 percent, US\$1.8 billion). In line with the global trend of increasing prioritization of



adaptation in DFIs climate portfolios, the 2019–2020 period was the first period where more finance commitments tracked from multilateral DFIs were directed to adaptation than to mitigation in Africa.¹⁰

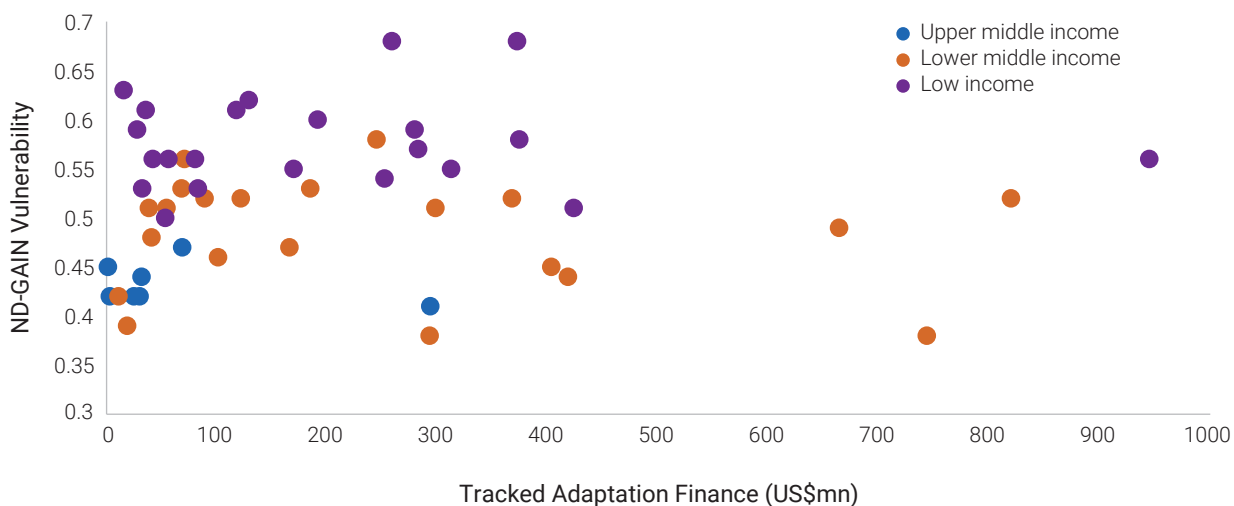
More than half (53 percent) of the adaptation finance commitments to Africa in 2019–2020 were loans. A high share of financing from multilateral DFIs was committed in the form of commercial-rate loans (41 percent) and concessional loans (32 percent), whereas bilateral DFIs primarily committed concessional loans (82 percent). By contrast, more than 90 percent of adaptation finance committed from governments was in the form of grants, with less than 6 percent in the form of loans. The share of grants and loans varies across regions and the income profile of countries. Low-income countries primarily attracted grant commitments for adaptation financing, whereas lower-middle-income countries largely saw commitments of loans at market rate (58 percent).



As shown in Figure 2, there is limited to no correlation at the country level between tracked adaptation finance and climate vulnerability.

Photo: Fiston Wasanga/CIFOR/Flickr

Figure 2. Tracked Adaptation Finance (US\$million) vs. ND-GAIN Vulnerability by Country



Adaptation finance commitments to Africa remain substantially below the estimated needs detailed in NDCs.¹¹ Despite the global health and fiscal crisis caused by the pandemic, positive factors influencing adaptation finance flows to Africa appear to have outweighed negative factors, resulting in an overall increase in adaptation finance. Numbers for 2021 are

not yet available and it is still premature to assess how 2022 events—notably the war in Ukraine and global supply chain and inflationary pressures—will impact investment for 2022 and beyond. A detailed summary of positive and negative factors can be found in Table 1.

Table 1. Factors Affecting Adaptation Finance Flows in Africa

Positive Factors	
DFI commitments to adaptation finance continue to grow	Pre-pandemic, nine MDBs announced a collective commitment to double their total levels of adaptation finance by 2025, to US\$18 billion annually. ¹² Toward that end, the World Bank announced a 35% target for climate finance as a proportion of total finance from 2021–2025, of which at least 50% will support adaptation. The African Development Bank (AfDB) has committed to a target of at least 40% for climate finance by 2025, to a doubling of climate finance to US\$25 billion between 2020 and 2025, and to prioritizing adaptation finance. While simultaneously mobilizing massive resources toward the global COVID-19 response, ¹³ DFIs have increased adaptation investments in Africa by an estimated US\$2.7 billion between 2019 and 2020.
Launch of innovative financing models	New innovative models for raising adaptation finance, such as the African Adaptation Acceleration Program (AAP) jointly developed by the GCA and the AfDB, are beginning to be deployed. These instruments are designed to fill the financing gap facing adaptation projects, both by providing upfront capital and adjusting the risk-return profile of projects to meet the requirements of private investors. Between 2019 and 2020, tracked adaptation finance flows from grants and concessional debt in Africa increased by US\$2.9 billion, with the potential to “crowd-in” commercial capital going forward.
International commitments at COP26	Additionally, COP26 outcomes included a call to action for developed countries to double their collective provision of adaptation finance from 2019 levels by 2025; strengthened adaptation finance pledges from multilateral organizations, governments, and private actors; and increased allocation of proceeds from market-based mechanisms toward adaptation. ¹⁴ The African Group of Negotiators on Climate Change is attempting to mobilize US\$1.3 trillion in climate finance by 2030, with adaptation remaining a top priority. ¹⁵
Negative Factors	
Capacity constraints	A number of capacity constraints within African countries limit access to adaptation finance. Many institutions, including National Designated Authorities (NDA), Direct Access Entities (DAEs), and other Accredited Entities (AEs), have constrained access to finance from climate funds given the significant technical and institutional capacity required to build project pipelines and generate proposals to climate funds including the Green Climate Fund (GCF). ¹⁶ Furthermore, there is a lack of reliable and accessible information about climate risks and impacts in many contexts. This lack of information combines with limited capacity to process available climate data and to translate findings into the necessary resilience measures.
Limited inclusion of resilience in stimulus packages	In the 2021 UNEP Adaptation Gap Report, ¹⁷ analysis of the fiscal stimulus packages of 66 countries—including all G20 and V20 countries—showed that less than one-third (18) of the responses were found to integrate physical climate-risk awareness and resilience components, including just three African countries: Niger, Ethiopia, and Kenya. As national budgets were strained during the pandemic, annual adaptation finance provided by domestic governments rose by only an estimated US\$156 million between 2019 and 2020.
Minimal private sector investment	Although capital outflows stabilized relatively soon after hitting record lows in March 2020, total foreign direct investment (FDI) declined 16% in 2020 in Africa to US\$40 billion, a decline to 2005 levels of investment. ¹⁸ While annual tracked private investment for adaptation in Africa rose between 2019 and 2020 by around US\$114 million, private investment only comprised 2% of total adaptation finance during the period.
Africa debt crisis	The macroeconomic strain caused by COVID-19 will continue to affect 2021 finance flows, with governments and private investors particularly impacted. 56% of African countries with a credit rating suffered downgrades in 2020, further weakening the financing ability of domestic governments. ¹⁹ Despite this setback, FDI in Africa has rebounded in 2021, with positive growth in nearly all sub-regions. ²⁰
Aftermath of COVID-19 and war in Ukraine	Since early 2022, the ongoing war in Ukraine has caused sudden hikes in energy and food prices, with massive disruptions to the international trade and supply chain systems. The uncertainties around food security and energy access may significantly affect the adaptation outcomes of planned and future projects. Even though adaptation financing flows from bilateral governments, and to a lesser extent from DFIs, can be expected to face constraints as resources are directed toward humanitarian aid, there are significant opportunities for building long-term adaptive capacity and resilience through a holistic and coordinated approach.

SOURCES OF ADAPTATION FINANCE

To mobilize further adaptation investment and to increase the impact of investments in terms of building resilience, a wide variety of sources of finance need to be tapped. Public spending alone cannot meet the adaptation finance gap, so private sector investment must scale up alongside public investment to supplement limited public resources.²¹ One initiative seeking to bring together key financial institutions within Africa to mobilize private flows toward climate objectives is the African Financial Alliance on Climate Change (AFAC).²² AFAC brings together multilateral, national, and regional development banks, central banks, commercial banks, institutional investors, stock exchanges, insurance companies, and ministries of finance to increase alignment on initiatives to

mobilize private capital to climate action. AFAC and other initiatives to galvanize partnerships to mobilize adaptation finance (including the Africa Adaptation Acceleration Program and the Africa Adaptation Initiative) are critical to leveraging the wide variety of finance sources that must play a role in increasing adaptation finance volumes and efficacy.

Figure 3 summarizes the financial actors that have a role to play in mobilizing finance for adaptation at scale in Africa. These actors offer financing along a spectrum of terms, ranging from highly concessional terms (lower return expectations and/or longer tenors) to commercial terms (market returns and tenors expected). Concessional capital is intended to fill a gap where the private sector (commercial capital) would not otherwise invest.



Photo: 2015CIAT/Georgina Smith/Flickr

Figure 3. Current and Potential Sources of Adaptation Finance in Africa

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- **Commercial Banks:** Commercial banks can raise their own funds through bank deposits and are governed by international standards set by Basel II and Basel III regulations for capital adequacy. Commercial banks have networks that can be leveraged for climate adaptation finance, including relationships with farmers, cooperatives, and micro-, small, and medium-sized enterprises (MSMEs). Commercial banks can also build technical capacity to structure financial instruments in partnership with development banks and other concessional finance providers. A constraint for commercial banks in Africa seeking to increase investment in climate adaptation activities is that they have historically tended to focus on relatively large firms and retail clients. Thus, as of 2014, 57 percent of the African population remained unbanked.²³
- **Pan-African Banks (PABs):** PABs can invest in MSMEs and mainstream resilience into their lending portfolios. PABs have been successful in increasing African firms' access to finance and increasing competition and efficiency in the banking industry, and can have a positive impact on micro-prudential stability. The Invest in Africa Initiative's members include pan-African and domestic commercial banks; it has also developed an online learning academy for small and medium-sized enterprises (SMEs). These initiatives and engagements create an opportunity to raise awareness of climate-related risks and increase capacity to invest in adaptation.²⁴
- **Private Equity and Venture Capital:** Africa's private equity industry was cultivated by DFIs that had a mandate to invest in private sector businesses in Africa to promote social and economic development. Gradually the industry expanded and there are now more than 400 private equity, venture capital, and asset management firms headquartered in Africa spread across regions and sectors. Private equity and venture capital are critical to scaling up adaptation finance in Africa because they can offer risk-tolerant finance to companies with limited access to bank loans or bonds.²⁵
- **African Institutional Investors:** African institutional investors have approximately US\$1.8 trillion in assets under management as of 2020. Institutional investors' core goals are capital gains and stabilization of returns over the long term. They have high capacity to mobilize funds through pensions and their prudential responsibilities require them to invest in assets that are listed and with high credit ratings.
 - **Sovereign Wealth Funds (SWFs):** SWFs invest in domestic markets and have the potential to finance adaptation-focused securities and government bonds. As detailed later in this chapter in a case study on Ghana, the Ghana Infrastructure Investment Fund (GIIF) SWF is currently seeking GCF accreditation. If able to tap into GCF funds, the GIIF could emerge as a key resilience infrastructure investment vehicle in Ghana.
 - **Pension Funds:** Pension funds are instrumental in mobilizing long-term savings and can thus support long-term adaptation investments. Pension fund assets under management in Africa have increased substantially in the last several decades and can provide key funding to private equity and venture capital markets in particular. For example, total assets under management in Nigeria's pension sector increased more than ninefold from 2006 to 2019

(to US\$33 billion), illustrating the size of the potential opportunity for targeted adaptation investment.²⁶

- **Insurers:** Insurers can play a role in providing sovereign cover for the impact of climate change (for example, the African Risk Capacity, which offers index-based weather risk insurance) and in helping households cope with risk of climate-related shocks. Insurance penetration is concentrated in a few major markets like South Africa, Egypt, Morocco, Nigeria, and Kenya. Many insurance companies must undertake qualitative and quantitative assessments of impact of physical and transition risks on their investment portfolios. Hence many insurers have advanced technical capacity to evaluate climate risks and to innovate via climate risk-transfer mechanisms.
- **Large Corporations:** Sustainability and resilience in food production and supply chains are increasingly a focus for large multinational corporations, especially those with global supply chains. Corporations have the potential to deploy finance (including potential issuance of climate resilience bonds) and technology at scale to undertake adaptation measures, though such measures will be largely focused on their own supply chains. Strategies reported by corporations to date in Africa to address climate risk include investing in physical climate risk analysis, supporting sustainable agroforestry in response to climate-related forestry risks, and investing in climate-smart capacity building for farmers in their supply chains.
- **Multilateral and Bilateral DFIs:** In every African Union region, the largest amount of adaptation finance tracked in 2019–2020 was from multilateral DFIs. DFIs play a critical role in mainstreaming adaptation in development finance by assessing climate risks and vulnerability, assisting country governments to build capacity for mainstreaming adaptation, and mobilizing private capital. DFIs are also uniquely placed to support adaptation investments in the private sector, which can create positive externalities for social and economic development. DFIs can bridge knowledge gaps through tools such as feasibility studies, business risk assessments, technical assistance, and market studies.
- **Sub-Regional Development Banks (SRDBs):** SRDBs have a mandate to contribute to regional integration and regional infrastructure development projects. Four African SRDBs (Eastern and Southern African Trade & Development Bank, East African Development Bank, West African Development Bank, and Economic Community of West African States (ECOWAS) Bank for Investment and Development) are operational in Africa in three separate Regional Economic Communities. ECOWAS, for example, is in the process of developing a regional climate strategy, and published an ECOWAS Guide to implementation of the Paris Agreement in September 2020 for its member states. SRDBs are relatively financially stable and shareholding countries generally report satisfaction with their performance, which makes them potentially suitable to mobilize more capital to finance adaptation in Africa.
- **National Development Banks (NDBs):** NDBs are state-owned or government-sponsored financial institutions with a primary mandate of providing long-term and concessional capital to high-risk sectors and industry, which are underserved by private commercial banks and contribute to the country's development agenda. NDBs are important intermediaries for international climate finance and more than 10 currently have direct access to GCF funding. NDBs' expertise

in domestic market opportunities, relationships with public and private sector entities, partnerships with large international MDBs, access to international capital markets to raise capital from a wide range of sources, co-lending ability in local currency for risk mitigation instruments like guarantees, and countercyclical nature of lending make them potentially important for financing resilient development in Africa.

- **Multilateral Climate Funds:** Multilateral Climate Funds established through international agreements or for a specific mandate provide financing for adaptation in Africa either through grants or market-linked instruments. They are catalytic in facilitating and accelerating financing in perceived high-risk adaptation projects by providing instruments like first-loss or junior equity, repayment guarantees, and grants to mobilize private investments.
- **National Climate Funds (NCFs):** These are national, country-driven, dedicated, catalytic financial institutions designed to address domestic market gaps, take ownership of climate finance, and crowd-in private investments in low-carbon and resilient projects. NCFs have the potential to provide integrated access to grants and finance to meet NDCs and also have strong potential to mobilize private sector investments. For example, as detailed later in a case study on Rwanda, the Rwanda Green Fund (FONERWA) serves as the main vehicle for climate finance in the country.
- **State-owned Enterprises (SOEs) and Financial Institutions:** SOEs are public entities that are partly or wholly owned by government to deliver services in a particular sector or sectors. SOEs have not financed many climate adaptation activities to date, but have substantial opportunity to lead in climate resilience given the size of their market share and public governance model.
- **African Governments:** Budgetary allocations are among the largest and most well-suited mechanisms for financing adaptation activities in Africa. African governments are already spending a considerable share of their budget on adaptation.²⁷ African governments are instrumental in deploying capital to non-commercial adaptation activities and current levels of expenditure meet around 10 percent of the total adaptation need.²⁸ As an illustration of the key role of African governments in deploying climate finance (as detailed later in a case study on Kenya), of the US\$2.4 billion in climate finance committed in Kenya in 2018, 28 percent (US\$670 million) came from public domestic sources, which include national ministries, subnational departments, and semi-autonomous government agencies.
- **Foreign Government Agencies:** Official development assistance (ODA) is a critical component of adaptation finance in Africa to de-risk adaptation activities and support more commercial finance. Bilateral agencies have a relatively high-risk appetite and strong climate mandates. Increasing global ambition should yield an increase in ODA for adaptation in Africa as countries seek to increasingly achieve a balance between adaptation and mitigation commitments in alignment with Article 9.4 of the Paris Agreement.
- **Philanthropies, Foundations, and Non-Profits:** Like ODA, funding from these organizations can de-risk adaptation activities, draw in private finance, and support technical capacity building. Philanthropic funding is nimbler and more flexible than ODA and can serve as catalytic capital for private sector investment.

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CASE STUDY: Addressing the Domestic Investment in Adaptation Gap in Ghana and Rwanda

Context and Introduction

As part of their NDCs, Ghana and Rwanda have estimated their adaptation finance needs at US\$12.8 billion²⁹ and US\$5.3 billion,³⁰ respectively, from 2020 to 2030. Both countries have identified agriculture, human settlements, water, transport, and health as key sectoral priorities for adaptation investment. Ghana aims to cover almost one-third of adaptation finance needs through domestic sources, and Rwanda has announced its intent to cover almost 40 percent of its total mitigation and adaptation needs by leveraging domestic sources of finance.³¹ Both countries have developed a range of policy frameworks and strategies to support the mobilization of domestic finance toward climate adaptation, including developing specific climate finance instruments, working to mainstream climate adaptation throughout the public sector, and engaging the private sector. These are now discussed in more detail.

Developing Tailored Climate Finance Instruments

In Ghana, the GIIF SWF is currently seeking GCF accreditation.³² If able to tap into GCF funds the GIIF could emerge as a key resilience infrastructure investment vehicle. To this end, in 2021 Ghana launched the Green Climate Fund Readiness Program, which aims to support the Ghanaian Government in strengthening national capacities to plan for, deliver, and monitor climate finance, as well as build private sector capacity.³³ The country also has issued sovereign bonds with adaptation components.³⁴

The Rwanda Green Fund (FONERWA) serves as the main vehicle for climate finance in the country. While originally capitalized by the UK, Rwandan, and German Governments, FONERWA's budget is now sourced from both public and private domestic and international sources. On the domestic side,

funding sources include the state-allocated budget, grants and subsidies, and various fines and fees from environmental penalties.³⁵ FONERWA is incorporated into the Rwandan Ministry of Natural Resources but has its own administration, including a Managing and a Technical Committee. The Managing Committee cooperates with public and private sector stakeholders, while the Technical Committee aims to ensure all projects are in line with national adaptation priorities and to avoid duplication with other government or private sector-led projects.

Further, the Government of Rwanda in partnership with the AfDB is developing the Rwanda Catalytic Green Investment Facility (RCGIF), which will utilize blended financing structures for not-yet-bankable projects through direct loans and credits issued by the Development Bank of Rwanda, and a project preparation facility at FONERWA to increase the bankability of projects.³⁶

Mainstreaming Climate Adaptation Throughout the Public Sector

Setting up a coherent and proactive policy environment is key to enhancing the effectiveness of climate finance and can in the long run strengthen countries' ability to tap into wider and more varied sources of finance.³⁷ In 2011, Rwanda launched its Green Growth and Climate Resilience National Strategy,³⁸ which aimed to mainstream climate change and low-carbon development into all areas of the economy and policymaking, with special emphasis on climate resilience.³⁹ Further, Joint Sector Reviews were set up to foster cross-sectoral dialogues across relevant ministries, non-governmental actors, and the public.

Ghana has identified limited in-country capacity and a siloed approach toward climate finance proposals across Government ministries as key challenges to meeting its climate adaptation finance needs as outlined in the NDC.⁴⁰ The government has announced plans to work on creating an enabling environment to attract private sector funds and to enhance domestic revenue mobilization through improvements in compliance, widening the tax net, digitization, and tax policies.

Indeed, adequate tax incentives and expanding the countries' tax base are key to mobilizing public funds. A joint study by Action Aid, the Government of Ghana, and the Integrated Social Development

Centre estimates that because of misaligned tax incentives,⁴¹ Ghana may be missing out on close to US\$1.2 billion annually in general tax revenues that could be directed toward climate finance, among others. The Ghanaian Ministry of Finance has identified improvements in compliance, widening the tax base and reassessing tax policies as key next steps to fulfill the country's NDC.⁴² Supporting initiatives to establish new specialized Funds to finance resilient infrastructure, deepening of bond markets, establishing Strategic Development SWFs, and using existing sovereign-backed pension funds for development projects are further recommended steps for the mobilization of domestic financial resources.

Lessons Learned

Private sector adaptation finance mobilization remains a challenge in both countries. To date, most entities engaging in climate finance have focused their efforts on mitigation.⁴³ Lack of government incentives for private sector involvement and limited awareness of public initiatives in this space are often cited as key barriers to private sector finance for adaptation. Moreover, SMEs in these countries often lack access to credit and funding, which limits their ability to invest in resilience measures.

In Rwanda, supported by several grants, FONERWA has developed capacity-building trainings specific to private sector actors and routinely holds private sector stakeholder engagement workshops.⁴⁴ The Fund, which also received grant funding to build capacity to identify climate interventions within the private sector, actively seeks out private sector project co-finance and reserves 20 percent of funds for private sector projects. More generally, in both cases, public-private partnerships, the use of compliance, and voluntary carbon market mechanisms have been put forward as potential options to attract private sector funds.⁴⁵



Photo: brittak/Stock

CASE STUDY: Tracking Domestic Public Finance for Adaptation in Kenya

Context and Introduction

Kenya is among the most water-scarce countries in the world and nearly half the population lacks access to basic water services.⁴⁶ Recurring droughts, flooding, and sea level rise will compound the issue resulting in severe crop, livestock, infrastructure, and freshwater losses in turn leading to widespread famine and displacement. Kenya's economy is heavily reliant on climate-sensitive sectors like fishing, agriculture, and forestry, which make up more than a third of its GDP and are already fragile from the 2020 locust invasion⁴⁷ and COVID-19 pandemic.⁴⁸

To respond to the significant climate risk facing the country, Kenya passed the Climate Change Act of 2016 and the National Climate Change Action Plan (NCCAP) to provide a framework for coordinating adaptation and mitigation efforts.⁴⁹ A landmark analysis from 2018 found that Kenya invested roughly US\$2.4 billion in public and private capital from both domestic and international sources toward climate projects.⁵⁰

Kenya estimates that it will need US\$65 billion through 2030 to achieve its NDC goals. The

national government plans to provide 13 percent of the funding, and the rest would be provided by international development partners.⁵¹ An analysis of the sources, instruments, destinations, and accuracy of Kenya's domestic public climate finance flows captures the breadth of the national and international efforts needed going forward to meet Kenya's NDC.

Public Domestic Climate Finance in Kenya

Of the US\$2.4 billion in climate finance committed in Kenya in 2018, 28 percent (US\$670 million) came from public domestic sources, which include national ministries, subnational departments, and semi-autonomous government agencies.⁵² Roughly half the US\$670 million was committed through the Government's central budget and the other half through semi-autonomous government agencies in the form of equity.

Only 12 percent of all climate finance funds committed in 2018 across domestic, international, public, and private sources were directed toward adaptation, most of which was spent in water and wastewater management. Figure 4 breaks down the sub-sectoral investments across these adaptation

efforts. However, 30 percent of the climate finance channeled through the Kenyan Government’s central budget was allocated to adaptation projects, indicating a higher sensitivity to adaptation needs compared with most investors.

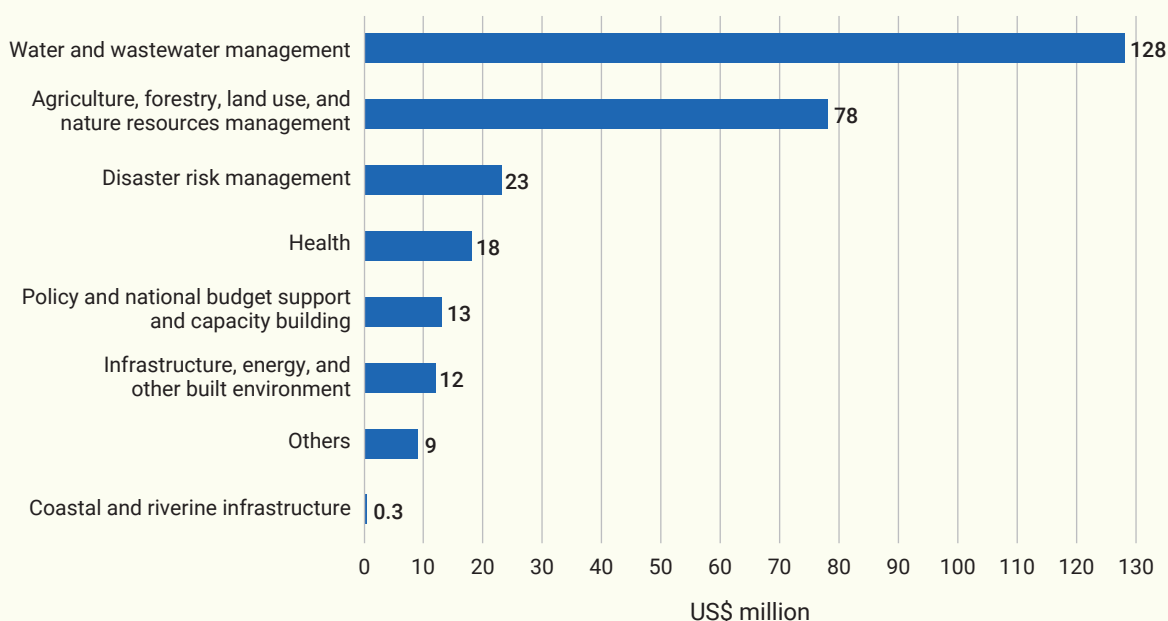
The sectoral breakdown of domestic equity financed projects was more difficult to ascertain due to a lack of visibility of expenditure data from semi-autonomous government agencies, which are the primary recipients of domestic and international finance flows.⁵³ They are responsible for budget implementation, making them the de facto implementers of climate projects in Kenya.⁵⁴ This lack of visibility makes it challenging to get an accurate overall picture of climate finance in Kenya.



Africa is facing three major challenges which are called the three Cs: COVID, climate and conflict. The solution to the three Cs is the same, three Fs: finance, finance and finance.”

Dr. Akinwumi Adesina
President, African Development Bank

Figure 4. Climate Finance In Kenya By Adaptation Sub-Sector (US\$million)



Recommendations and Lessons Learned

Improving climate finance visibility is vital in enabling governments and international investors to operationalize their capacity to act on the data and close investment gaps. For example, after the release of the 2021 Landscape of Climate Finance in Kenya report the central Government issued a new training handbook and Government-wide circular for tracking and reporting climate finance spending. Broadly speaking, this transparency and accuracy in climate

finance flows is vital in Kenya and across Africa to help the national ministries, DFIs, and international investors to know which sectors to prioritize for future investments in order to close the gaps and build resilience where needed.

There is a need for African nations to modernize their public financial management systems to enable more granular levels of climate finance expenditure tracking. Kenya needs expenditures from all ministries, departments, and semi-autonomous

government entities to be reported through the central Government’s public financial management system, known as the Integrated Financial Management Information System (IFMIS). A new analytical segment of the IFMIS called Segment 8 has been introduced but not yet rolled out, which would allow for distinct levels of tagging climate-related expenditures for adaptation, mitigation, and cross-cutting activities.⁵⁵ African nations should begin developing similar functionality in their finance ministries, without which climate expenditures will continue to be manually tagged in ad hoc ways with conflicting information and double counting impairing the accuracy of the data.

Adaptation frameworks need to be institutionalized into ministries and departments that oversee tagging and tracking of climate finance expenditures. Due to definitional issues, much of Kenya’s adaptation

finance could not be properly tracked. However, Kenya had already developed a Tracking Adaptation and Measuring Development (TAMD) framework in its National Adaptation Plan, which contained a series of top-down county-level institutional adaptive capacity indicators and bottom-up vulnerability indicators that spanned the national and sectoral levels.⁵⁶ There is a need for these existing taxonomies and frameworks, both in Kenya and other African countries, to be substantively used and to filter down to the line ministries that are tasked with tagging climate finance. This will help align climate projects implemented by entities at different levels of government as that data is fed into a public financial management system, thus streamlining data reconciliation and improving the quality of the qualitative information that is reviewed and tagged for adaptation.



Photo: hadynyah/Stock



CASE STUDY: Egypt's Green Sovereign Bond

Context and Introduction

Egypt's Nile Delta faces significant climate risks.⁵⁷ Sea level rise and flash floods will likely lead to inundation and erosion of a sizeable portion of the northern delta, and extreme heatwaves and dust storms will severely strain water resources and the agriculture sector, which employs a third of the country's labor force. In response to these threats, Egypt has launched Vision 2030, a holistic sustainable development strategy that includes specific aims to prepare the country for climate change. As part of this effort, Egypt's Ministry of Finance debuted the first sovereign green bond for the Middle East and North Africa region in September 2020.⁵⁸

Green bonds are a debt instrument that allows the issuer to raise finance as through a typical bond but where the proceeds are earmarked for projects with environmental benefits. Green bonds have been used in other contexts, such as the world's first sovereign blue bond issued by the Seychelles in 2018 to support sustainable marine and fisheries projects.⁵⁹ Ghana has also recently implemented a green bond

program called the Green Exchange, which aims to raise US\$5 billion.⁶⁰

Egypt's green bond was met with significant investor interest. The initial US\$500 million sale was oversubscribed by more than seven times with US\$3.7 billion of purchase orders. This prompted the Egyptian Ministry of Finance to increase the sale to US\$750 million and lower the investor return to 5.25 percent—the lowest yield for a five-year bond in the country's history.

Relevance of Green Bonds to Adaptation in Africa

Fifty-four percent of the green bond proceeds, or roughly US\$400 million, have been spent on 14 water and wastewater projects including desalination and sludge treatment facilities. The remaining 46 percent, about US\$350 million, has been spent on clean transportation to build a monorail system from Cairo to the new capital known as the New Administrative Capital. Egypt has passed an independent review certifying that the program meets the International Capital Markets Association's Green Bond Principles.

Though the aims of Egypt’s green bond issuance are not solely adaptation focused, the bond aligns relatively closely with the Climate Bonds Initiative’s (CBI) climate resilience principles advanced in 2018. The principles broadly seek to determine whether the proceeds from a green bond sale are invested in a way that either enhances the climate resilience of an asset over its lifespan or increases the climate resilience of a broader sector/system.

CBI has outlined six illustrative examples of investments that would enhance the resilience of an asset, including relocating at-risk infrastructure and implementing drought-resistant seeds. CBI also noted six sectors that would enhance the resilience of a broader system including—with most relevance for Egypt’s green bond—water, which encompasses investments in wastewater treatment, desalination, and strengthened water distribution.⁶¹ Table 2 notes the elements of close alignment between Egypt’s green bond issuance and CBI’s climate resilience principles. This evaluation is intended to help explain Egypt’s bond through the lens of climate resilience but is not intended to be definitive given the limited public information available to make a comprehensive expert assessment.



Table 2. Alignment between Egypt’s Sovereign Green Bond and CBI’s Climate Resilience Principles

Resilience Bond Principle	Egypt Green Bond Alignment
Assets and activities receiving investment must have clearly defined boundaries and identify interdependencies for assessing climate risks and resilience impacts	Egypt has defined seven categories of assets and activities eligible to be financed: energy efficiency, renewable energy, sustainable transport, green buildings, waste and water efficiency, energy management systems, and non-greenhouse-gas (GHG) reduction energy management systems. During the screening process, a team utilizes the International Finance Corporation’s (IFC) Climate Assessment for Financial Institutions tool, ⁶² which notes that an adaptation project should reduce risk, exposure, and sensitivity to climate change and also increase climate resilience. ⁶³ As part of the green bond issuance process executed by the Commercial International Bank (CIB), the green bond issuer, the findings are also vetted by a Green Bond Task Force. ⁶⁴
Expected climate resilience benefits assessment must be undertaken for system-focused assets and activities receiving investment	Egypt has determined resilience benefits for its water treatment projects across cubic meters/day of treated water, megawatt hours of electricity generated, and number of people benefiting from the projects. ⁶⁵ It has outlined a formal set of impact indicators that inform six green bond project types: energy efficiency, renewable energy, green buildings, sustainable transportation, water and wastewater, and waste projects. Indicators for its primary resilience project type, water and wastewater, include annual absolute (gross) water use before and after the project in m ³ per year, reduction in water use (in percentages), and annual absolute (gross) amount of wastewater treated, reused, or avoided before and after the project in m ³ per year or as percentages. ⁶⁶
Mitigation tradeoffs must be assessed	Egypt has calculated the GHG emission reduction benefits for its projects ⁶⁷ and reports on any emissions generated, ⁶⁸ thus allowing for mitigation tradeoff analyses.
There must be ongoing monitoring and evaluation	Egypt will conduct an annual report evaluating the use of its green bond proceeds ⁶⁹ while also establishing a national committee for monitoring progress on the UN Sustainable Development Goals. ⁷⁰



Recommendations and Lessons Learned

Though Egypt's green bond is not solely climate adaptation focused, it has significant potential to deliver climate resilience benefits. Other countries can benefit from the lessons learned from Egypt's implementation to move forward with similar initiatives. African DFIs and ministries of finance can, for example, look to leverage and potentially replicate Egypt's Regional Center for Sustainable Finance (RCSF) to build institutional capacity. Following the launch of the green bond program, Egypt established the RCSF with the aim of removing market barriers in the Middle East and North Africa region to integrate sustainable finance practices, instruments, and management models. African nations should take advantage of RCSF's training and educational institutes for capacity building on sustainable finance literacy, debt management operations, cross-ministry coordination, and technical support for setting up their own green finance programs.

Egypt's green bond issuance also benefited from the establishment of a robust legal and green financing framework in collaboration with international finance institutions including the World Bank and the IFC. Egypt brought together three crucial ingredients that enabled the right economic and political conditions for its green bond program,

setting a template for other African nations to model. First, early involvement from key ministries who established a guiding green bond framework, thus imparting confidence in the sustained political support for the program.⁷¹ Second, utilizing the CIB, the nation's largest private bank, to issue the green bond sale. This ensured that the deposits were held in a separate account in a safe and liquid part of the domestic financial system, which made it easy to provide proof of documentation and tracing of project and category level allocations during audits. Lastly, partnering with the World Bank and IFC to act as technical advisors on the project created global credibility on the execution of the sale and use of proceeds and served to guide assessments of impact indicators.⁷² Awareness of these ingredients for success will be valuable for replication and scale.

Finally, concessional funding from DFIs, foreign governments, and foundations could help increase climate information collection to bolster the adaptation relevance of green bond-financed projects moving forward.⁷³ This information could unlock further investor interest and set up a future pipeline of resilience-focused projects. In Egypt and beyond, this work could allow countries to expand the resilience pipeline and promote further liquidity in the green bond market and prove investor demand.⁷⁴

BARRIERS

There are cross-sectoral barriers as well as sector-specific barriers hindering investment in adaptation activities. Table 3 summarizes key barriers to investment across seven key sectors assessed in this analysis alongside cross-cutting barriers that affect investment potential across sectors.

Table 3. Barriers to Mobilizing Adaptation Finance by Sector and Cross-Cutting

Sector	Barriers
Cross-cutting	<p>Constrained macroeconomic environment: The macroeconomic strain caused by geopolitical and health conditions, including the COVID-19 crisis and ongoing war in Ukraine, will continue to affect adaptation finance flows. Credit rating downgrades may weaken the financing ability of domestic governments and international governments and DFIs may face constraints as resources are directed toward humanitarian aid.</p> <p>Inadequate risk-adjusted returns: Returns do not compensate investors in developing countries for the additional risk associated with unfavorable regulations and policies, such as foreign investment restrictions.</p> <p>Complexity of due diligence for projects: Many private sector actors, including institutional investors, have largely avoided financing infrastructure projects across sectors in the region due to cost recovery challenges and the complexity of the technical due diligence.</p> <p>Limited capacity to collect and analyze relevant climate data: The lack of reliable and accessible information about climate risks and impacts, combined with limited capacity to process available climate data in infrastructure modeling and translate findings into the necessary resilience measures, makes it difficult to adapt proactively.</p>
Water	<p>Lack of municipal/subnational implementation capacity: Water projects often involve municipal or other subnational implementers with limited implementation capacity (to pursue finance, structure an adaptation project, or access climate analytics).</p>
Agriculture	<p>Policy and regulatory barriers: Lack of regulatory incentives for climate-smart agriculture in terms of priority lending and mal-incentives in regulatory environments with subsidies for non-adaptive crops.</p> <p>Limitations in aggregation: Difficulty in aggregating or securitizing many small-scale projects due to local contexts and disparate level of development.</p>
Transport	<p>Variability of climatic conditions within a single project: Transport projects are often cross-jurisdictional in nature and therefore face a complex range of climate risks.</p> <p>Public sector orientation of the sector: Even more than for other infrastructure projects, some elements of the transport sector including roads, railways, and ports are often publicly owned and operated and private sector investment involvement may not be feasible.</p>
Energy	<p>Need for regional coordination: As countries are tackling domestic energy security challenges separately, this is creating build-up of overcapacity in some countries and deficiencies in others.</p> <p>Risk attitudes of decision-makers: Given the long lifespan of energy infrastructure, ranging from 50 to 100 years for hydropower assets, it is critical to base expansions and new infrastructure investments on future climate projections. However, uncertainties around climate projections and the magnitude of associated revenue losses contribute to the lower risk capacity of decision-makers.</p>
Urban infrastructure	<p>Lack of subnational fiscal autonomy: Subnational borrowing capacities for infrastructure and other capital needs are severely constrained, making long-term planning for climate resilience challenging and creating delays in responding and recovering promptly from disasters.</p>
Coastal ecosystems	<p>Challenging economics: Adaptation in coastal ecosystems is often overlapping with flood risk management and land-use planning, which have significant public goods characteristics, making it difficult to build an economic case.⁷⁵</p>
Land use and forestry	<p>Multi-stakeholder solutions can create complexity for channeling funding: Developing and implementing solutions in land use and forestry involves numerous actors and flows across sectors and jurisdictions. Coordination across these sectors and jurisdictions can make the design and implementation of funding solutions complex.</p>



Photo: Rod Waddington/Flickr

RECOMMENDATIONS

Mainstream Adaptation and Resilience into Investment Decision-making

Many investors in Africa are already engaged in investment that has significant relevance to adaptation goals, but their investments are not yet climate-resilient. For example, a multinational corporation investing in Africa along an agricultural supply chain or an infrastructure investor building a water treatment facility will be operating in a sector with substantial climate risk, but may not be screening for climate risk nor mitigating that risk. To enable financial institutions to mainstream resilience into the investments they are making, the following steps are critical:

- **Increase access to robust climate information:**

There is a critical lack of climate data in many parts of Africa, which limits adaptation projects and leads to uncertainty about the optimal approach to building resilience. The poorest countries have the most significant lack of climate data: either they are post-conflict or fragile states, or simply do not have the funding and technical resources to develop climate data such as groundwater baseline data, 24–48-hour precipitation data, and forward-looking climate projections. More targeted concessional finance and grants from DFIs, donor governments, and foundations are needed to support policymakers and other implementers in collecting and providing access to sufficient data, as well as to support collaboration and training

on open-source models that can utilize the data. Across the board, there should be an emphasis on increasing access to high-resolution climate data at low cost so that implementers may undertake climate risk assessments as a basis for future adaptation planning.

- **Build capacity of African financial institutions and government entities to evaluate and act on climate risks:** A concerted effort should be made to increase membership of pan-African banks, locally based pension funds, and national development banks in international financial initiatives such as the UN Principles for Responsible Investment and Banking, and the International Development Finance Club—and to provide these institutions with the resources to participate actively. Capacity building is also crucial to strengthen African financial institutions' capacity to access finance from Climate Funds through pre- and post-accreditation support.
- **Require disclosure of climate risks, via national legislation and/or via DFI on-lending:** Domestic financial regulators in Africa should consider requiring financial institutions to disclose climate-related risks in line with the Task Force for Climate-Related Financial Disclosures (TCFD) recommendations. Moody's has found that the 49 banks it rates across Africa have more than US\$200 billion in lending across sectors with high potential climate risk, so disclosure of climate risks is critical.⁷⁶

Build an Enabling Environment for Adaptation Investment

The enabling environment in a country is critical to the viability of adaptation investment. Key factors that influence the strength of the enabling environment for investment in adaptation and resilience are reflected in Table 4 where a country with a strong enabling environment has the majority of these factors in place:

To build the enabling environment of countries that do not meet the key factors in the enabling environment captured in Table 4, key actions needed include:

- **Articulate investment-ready National Adaptation Plans (NAPs) and mainstream climate resilience in government procurement:** Having a nationally articulated strategy for adaptation is critical for establishing long-term expectations, identifying priority actions across sectors, and indicating areas for private sector participation. Only six countries in Africa have submitted NAPs to date, while 34 other countries have received funding or have submitted proposals to access funding from the GCF and the Least Developed Countries Fund (LDCF) for NAP development. Policymakers should ensure that adaptation planning is incorporated and mainstreamed into all relevant policy and procurements plans. An increased focus on climate adaptation mainstreaming within procurement plans in particular is critical to ensure that international infrastructure investment must screen for and build in resilience.
- **Build capacity to develop science-based policy and projects:** For much international public climate finance, there is a need to establish attribution between a climate impact and the corresponding action/measure that aims to mitigate that impact. This attribution is challenging, requires substantial quantitative and science capacity, and is often a critical factor for mobilizing adaptation finance.

There is a substantial need to increase capacity to translate science into policy, and to translate policy into investment needs, for instance by utilizing climate resilience indicators to prioritize budget allocations. Resilience outcomes are also difficult to track against a moving baseline—for example, other development projects may have also contributed to improved social outcomes in a given region.

- **Improve macroeconomic environments and adopt a multifaceted approach to address debt burdens faced by African countries:** African finance ministers have called for external assistance of US\$100 billion annually over the next three years to close a financing gap of US\$345 billion to achieve a sustainable recovery.⁷⁷ The participation of private creditors will be critical to relieve existing debt burdens, requiring innovative financing models that set clear incentives. Additional actions that should be considered to address debt challenges in African countries include: 1) advancing efforts to link credit ratings with reductions in climate risk to incentivize resilience and lower the cost of debt; 2) continuing implementation of the Debt Service Suspension Initiative (DSSI) program and seeking as many avenues as possible for alleviating debt strain on African countries as a key strategy to increase domestic adaptation finance; and 3) exploring development of sovereign bonds with an adaptation component (e.g. Ghana’s 2030 bond with an International Development Association guarantee of 40 percent) and scaling up sovereign debt-for-adaptation swaps to countries where conditions are viable.⁷⁸

Deploy Innovative Finance Instruments

There is a wide array of available investment instruments, risk-finance mechanisms, and broader finance-relevant solutions that financial actors are already mobilizing in support of climate

Table 4. Key Factors in the Enabling Environment

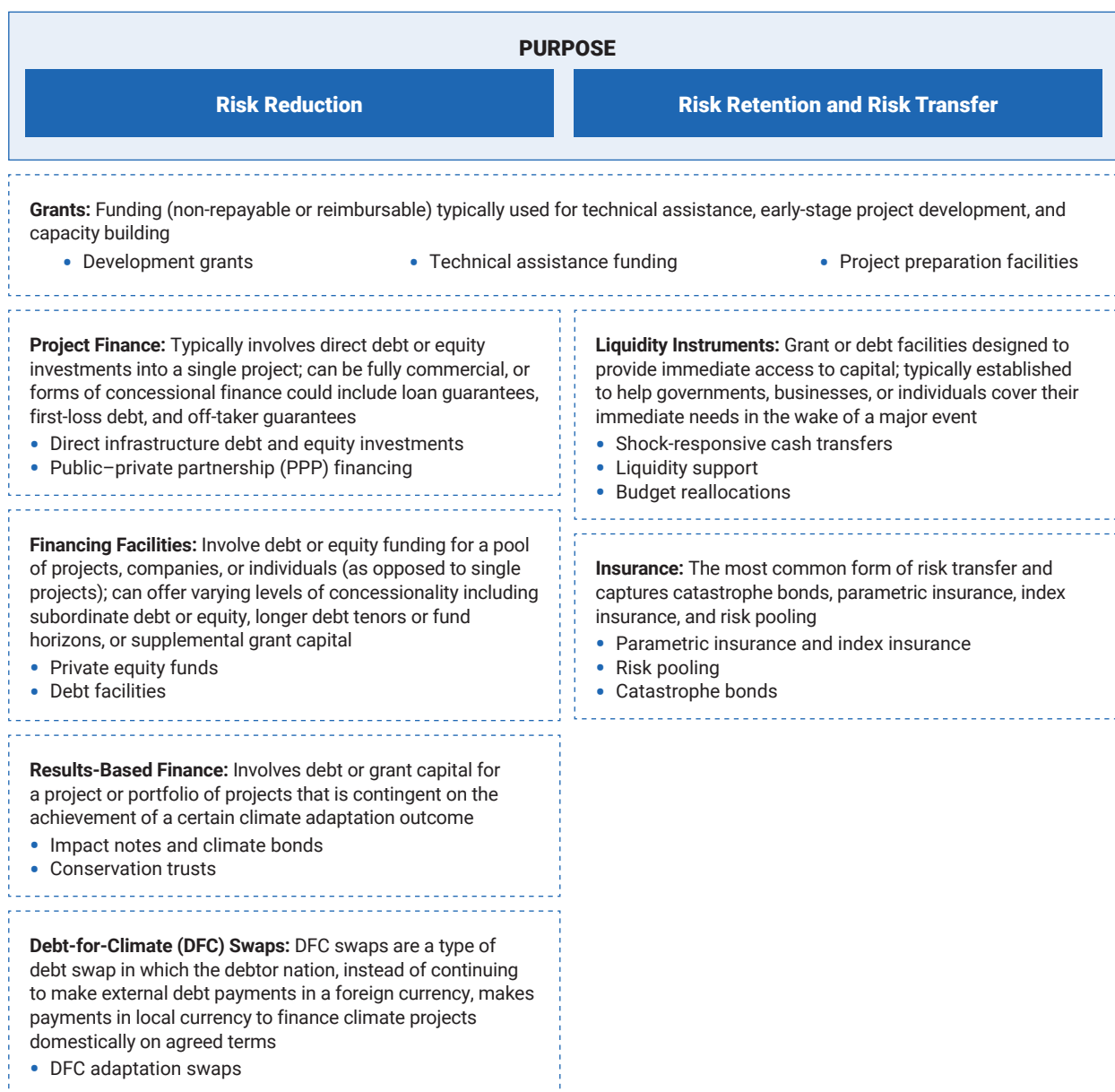
Policy environment	Market environment	Institutional/stakeholder environment
<ul style="list-style-type: none"> • National adaptation plans/strategy in place • Regulations enforcing adaptation measures (i.e. building codes) • Availability and capacity to analyze climate data 	<ul style="list-style-type: none"> • Access to international markets • Developed insurance market • PE/VC availability • Subnational borrowing capacity 	<ul style="list-style-type: none"> • Availability of accredited entities for accessing climate finance • Engagement of NDBs, regional development banks, and other regional institutions

resilience across Africa. The universe of financial instruments captured in this analysis is represented in Figure 5. The level of “concessionality” required for certain instruments will vary by market or policy environment. Financial instruments can be used to finance activities that build physical resilience to climate change impacts (reducing physical risk) and are also useful in responding to risks where physical climate impacts cannot or have not been eliminated (through risk-transfer and risk-reduction instruments).

It is critical to carefully select a financial instrument or structure that meets the conditions and activities

targeted. Selection of appropriate financial instruments must be informed by the sectoral focus of the adaptation activity, underlying country-level policy and market conditions, and the stakeholders and actors engaged. Instruments will only function successfully when they target an appropriate context. Key factors that must be considered when designing an instrument include currency stability, strength of the project pipeline, strength of debt capital markets, presence of a strong policy environment, existence of a sovereign credit rating, existence of a corporate bond market, robustness of climate information, and engagement/existence of a domestic private sector.

Figure 5. Financial Instrument Types



Three examples of financial instruments implemented to finance adaptation in Africa that match well with the conditions of the implementing context are:

- **The Food Securities Fund.** The Food Securities Fund seeks to provide working capital loans to agricultural aggregators (cooperatives, processors, traders) operating in developing and emerging markets. The fund has been developed by Clarmondial with input from leading institutional investors, agribusinesses, and conservation organizations and aims to provide an additional source of timely and affordable credit to support the transition to sustainable agriculture, notably on climate mitigation, sustainable land management, rural livelihoods, and gender. The fund targets local SMEs operating in established value-chain relationships and will be most successful in markets where there are relevant agri-SMEs and where access to working capital is scarce. The fund will also appeal to investors primarily in areas where institutional investors have an interest in SDG-aligned fixed income and private credit investments and which are primarily targeting European and US institutional investors (banks, pension funds, insurance companies).
- **DFC Swap – Seychelles.** In 2017, the Seychelles became the first country to successfully undertake a DFC swap aimed at specifically protecting the world's oceans. The Nature Conservancy (TNC) acquired Seychelles' foreign external debt at a discounted price and raised additional donor funding worth US\$5 million from private actors. The Government of Seychelles will repay the loans to a specially created Seychelles Conservation and Climate Adaptation Trust by TNC. Key conditions met within the market and policy enabling environment that led to the success of the swap



include: the country has a high level of public external debt held bilaterally by other sovereigns, is in a position to service their debt but has a limited fiscal capacity to mobilize domestic public climate finance, and had high-level political and whole-of-Government support.

- **Komaza Smallholder Forestry Vehicle (SFV).**

A forestry business based in Kenya whose mission is to move small-scale farmers out of poverty. SFV is an instrument that packages tree production partnership contracts with thousands of smallholder farmers and sells them to investors, providing farmers and forestry companies with access to low-cost, long-term finance while enabling institutional investors to access sustainable forestry investments. The instrument has broad applicability in terms of a market and policy enabling environment because it is based on funding to and contracts with individual farmers.

CONCLUSION

African countries are among the most at risk of increasing frequency and severity of climate-related shocks and stressors. There is a pressing need to invest in climate change adaptation to support individuals, SMEs, municipalities, corporations, financial actors, and governments in building resilience to climate impacts. To date, climate adaptation finance which are scaling far too slowly to build climate resilience, even as the costs of climate impacts rise.

- To mobilize the levels of investment needed and to increase the resilience impact of these investments, a wider variety of sources of finance must be tapped. A three-pronged strategy is needed to tap the wide range of potential actors: 1) mainstream adaptation and resilience in investment decision-making; 2) build an enabling environment for adaptation investment; and 3) aggressively deploy innovative finance instruments at scale toward adaptation activities. Action taken now across the full range of potential adaptation finance sources will be critical to determining the course of Africa's capacity to respond to present and oncoming climate impacts and to building a more climate-resilient and livable future.

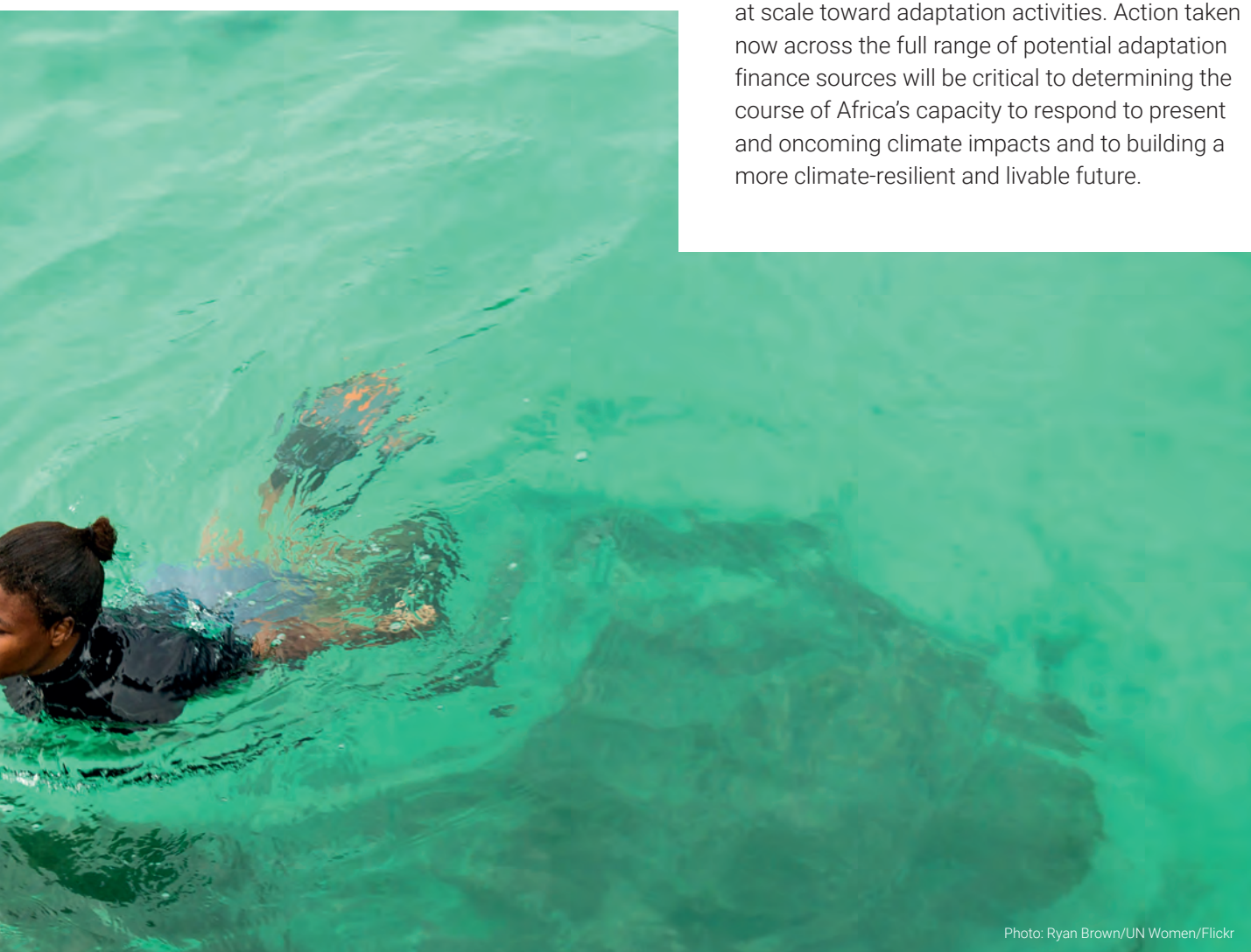


Photo: Ryan Brown/UN Women/Flickr

Fiscal Policies for Adaptation: IMF Perspective

Photo: Andrew McConnell/Panos Pictures

Climate change is emerging as a critical threat to long-term economic growth and stability. The fiscal impacts of climate shocks are very important for many economies with weak resilience. The International Monetary Fund's (IMF) policy guidance on adaptation focuses on financial and institutional resilience building to natural disasters and infrastructure investments to cope with rising sea levels and other warming-related phenomena.

The IMF Staff Climate Notes are a series of reports that discuss the fiscal policies for climate change adaptation.¹ This insert presents a summary of the key messages from recent Climate Notes, focusing on the processes and implications of integrating climate change adaptation into macro-fiscal policies. The IMF Staff Climate Notes make a case for adaptation to be part of a holistic, sustainable, and equitable development strategy. Effective decision-making can maximize the impact of scarce resources and ensure climate-resilient

societies. This is particularly important for countries in Sub-Saharan Africa that are at risk of entering poverty traps due to a vicious cycle of low economic development, increasing climate vulnerability, and low adaptive capacity.

ECONOMIC PRINCIPLES FOR INTEGRATING ADAPTATION INTO FISCAL POLICY

Climate change impacts and adaptation to it will affect economies across the world. However, these impacts will be heavier for lower-income and small, vulnerable nations with a higher proportion of economic activity in climate-sensitive sectors. The complexity, cost, and limits of adaptation increase with the speed and severity of climate change.

An important message of the IMF Staff Climate Notes is that despite its many benefits, adaptation to climate change cannot replace mitigation. Both are necessary to reduce damages from climate change. Adaptation can only partly compensate for delayed mitigation efforts, and without sharp greenhouse gas reductions, the stabilization of global temperatures

will not be possible, making adaptation impossible or too expensive for some countries, as discussed in the climate risk sections of the 2021 and 2022 editions of the State and Trends in Adaptation report.

The IMF Staff Climate Notes recommend that, just as for other development programs, the principles of welfare economics can be used by decision-makers to make informed choices on adaptation policies and programs for climate change. Governments should prioritize adaptation policies with positive externalities by removing market imperfections and policies that hinder adaptation actions by the private sector. Since adaptation benefits tend to be local and private, individuals and firms are already strongly incentivized to adapt. Therefore, progress on adaptation is not affected by coordination problems as much as progress on mitigation is.

The IMF work indicates that climate adaptation can lead to productive and stable economies in Africa in the long term. Systematic investment in risk reduction results in significant development co-benefits. For example, adaptation actions have resulted in the decline in deaths from climate-related disasters over the last hundred years (especially from droughts) and contributed to the modest upward trend (in some studies, no trend) in economic losses

due to climate disasters at the global level.² However, climate change can exacerbate inequalities between and within countries and will disproportionately affect the poorer sections in countries of all income levels.

Some countries are on the verge of entering a poverty trap through a vicious cycle of low economic growth and increasing climate vulnerability. Sub-Saharan Africa is at particular risk from extreme weather with limited adaptation capacity. Capacity development, large investments, and external aid are indispensable to prevent such vicious cycles.

According to recent IMF calculations for Sub-Saharan Africa, each large-scale drought reduces medium-term growth by one percentage point, with low-income households most severely affected as their coping mechanisms are limited. IMF research reflects that key adaptation policies integrated into near- and medium-term budgets can impactfully reduce vulnerability to climate shocks and support sustainable and inclusive growth. For instance, in Ghana, the use of improved seed varieties and irrigation has bolstered cocoa's drought resistance and increased productivity. Similarly, the development of rust-resistant wheat varieties has increased yields by up to 40 percent in some cases in Ethiopia.



Photo: Nyani Quarimya/Panos Pictures

Cost–benefit analysis (CBA) methods, which are often used to evaluate development programs, can also be applied to adaptation programs. The IMF recommends considering adaptation and other development priorities together, including synergies and tradeoffs among different development goals. By consistently investing in projects with the highest returns, governments can maximize the impacts of their spending. Estimating net benefits for adaptation programs and monetizing the benefits far in the future is fraught with uncertainty. But CBA is routinely applied to many investments with long lifetimes, and the same guidance developed for other sectors can be used for adaptation projects. Again, a major difficulty of such projects is the reluctance of policymakers to invest in ventures with a much longer time horizon than the usual electoral cycle. Even here, using CBA can allow African policymakers to emphasize the benefits over the entire lifetime of the project, including the possibilities for adaptation to growing risks linked to climate change.

Governments could decide to use adaptation policies for redistribution motives within and between countries. If so, they would benefit from weighing the costs and benefits of redistributive adaptation programs against those of other available redistribution instruments. The IMF recommends giving preference to a combination of efficient adaptation policies with dedicated redistributive programs if they have larger aggregate net benefits for the entire population and the most vulnerable. To ensure consistency across multiple programs, including all development investments, governments can standardize how they assess tradeoffs across investment programs, different groups in society, and different goals.

MACRO-FISCAL IMPLICATIONS OF ADAPTATION TO CLIMATE CHANGE

Climate-related disasters worsen fiscal balance ex post, creating explicit and implicit liabilities that trigger additional borrowing. Assessing disaster risks would help countries calculate the size of required fiscal buffers. Examining both explicit and implicit liabilities can inform financial planning and post-disaster response.

Climate change costs are calculated as the sum of the cost of adaptation and the costs of residual risks. Experience shows that these costs can be

greatly reduced by timely adaptation. Estimating and incorporating projected climate damages into macro-fiscal policies can aid government planning for climate change. This exercise is particularly important for vulnerable developing economies and Small Island Developing States. Despite the challenges in the exercise there is a growing consensus that the returns on climate adaptation are large. Macroeconomic simulations spanning the 21st century to calculate global average returns for the optimal level of adaptation show high average returns.

Global estimates of public funding needs for adaptation in 2030 are 0.25 percent of world GDP per year on average.³ However, this is not representative of the challenges faced by many countries. The IMF analysis points to annual adaptation costs exceeding 1 percent of GDP for some developing countries, and above 10 percent of GDP for some island states. For some lower-income vulnerable countries, bottom-up self-assessment of their needs can be as much as 100 to 250 times higher than global averages. The 46 countries that included adaptation cost estimates in their Nationally Determined Contributions (NDCs) estimate a collective cost of almost 1.5 percent of their GDP annually from 2015 on average. These estimates vary widely due to different definitions of adaptation needs and future development levels and varying assumptions of adaptation goals, climate change, and adaptation technology. Better estimates with local information and data collection are needed to ensure the necessary resources for adaptation are mobilized for Africa.

According to IMF calculations, strengthening new and existing public assets from current storm and flood risks alone could cost 0.4 and 0.6 percent of GDP per year, respectively, from 2021 to 2025, with large disparities across countries.⁴ Emerging markets face the largest costs, followed by low-income countries. The costs of improving private-sector asset resilience could be twice as high, though more evenly distributed across income groups.⁵

Market distortions arising from policy failures can be addressed by governments as part of a comprehensive plan to improve economic efficiency while considering the distributional implications of these measures. Market reforms targeting market failures and credit constraints, particularly for low-income consumers and small firms who are

impacted severely by climate shocks, can have considerable positive benefits. Subsidies such as investments in agricultural research or energy technology can help deliver a socially optimal amount of climate change adaptation with positive externalities. In terms of international aid, the costs and benefits of adaptation investments must be

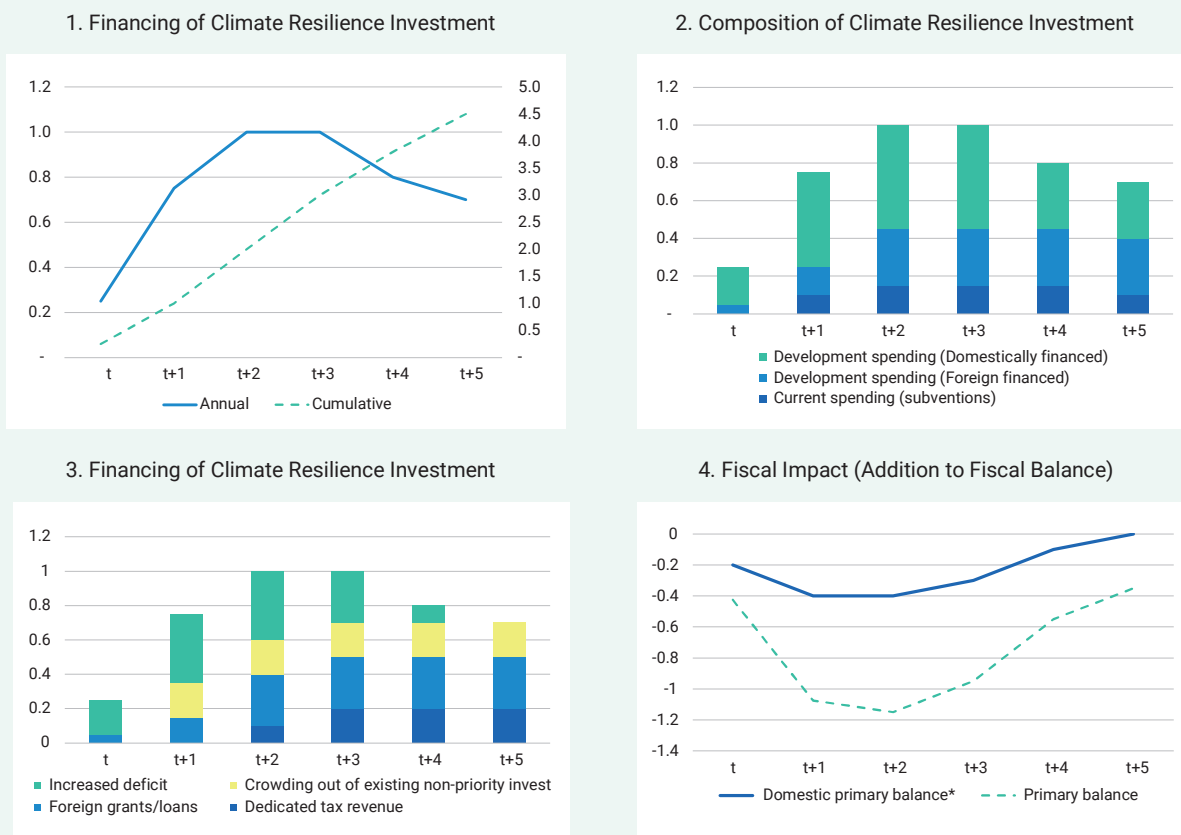
weighed by international donors against those of other uses of such aid, if the investments are not additional to existing development assistance or if they do not have significant development benefits.⁶ This will ensure that adaptation projects effectively contribute to development goals of the society.

Box 1. Malawi: Investment Scenario with Fiscal Impacts

Results from several post-disaster studies show that improving resilience to climate shocks can potentially lead to a virtuous cycle of self-reinforcing adaptation and development. Malawi is one of the countries that is most vulnerable to climate change impacts in Sub-Saharan Africa. The increasing frequency and intensity of climate-related disasters has created the need for adjusting baseline macroeconomic projections for the country. Therefore, since 2019, the IMF has integrated the macro-fiscal implications

of climate change into its analysis for Malawi. Climate shocks were integrated into the baseline macroeconomic projections for the country, and its debt sustainability analysis included alternative tail-risk scenarios, with the magnitude of climate shocks assumed in the baseline being amplified. This exercise helped assess the required fiscal space and the efficacy of existing and planned buffers, revealing large gaps in the country's fiscal financing needs.

Figure 1. Malawi: Investment Scenario with Financial Impacts



Source: IMF. 2022. Macro-Fiscal Implications of Adaptation to Climate Change. Staff Note. Current primary balance is defined as the sum of planned climate-dedicated taxation, crowding out of investment, and current spending on climate subventions less domestically financed development spending.



The IMF today is a systemically significant institution in the fight against climate change. We integrate climate in our policy analysis and policy recommendations, in our financial sector assessments. We integrate it in our public investment management assessments. And we now have an instrument to finance, to put money where our mouth is – the Resilience and Sustainability Trust. It is now at US\$40 billion strong.”

Kristalina Georgieva

Managing Director, International Monetary Fund

For longer horizons, macro-frameworks should reflect all climate change effects, in addition to disaster episodes. Climate change will likely also affect long-term debt sustainability, particularly for vulnerable countries. In long-term scenarios that assume little or no climate change mitigation, the literature predicts that vulnerable countries will have significantly lower GDP per capita levels by 2050 compared to scenarios without climate change. Therefore, long-term sustainability is best assessed using long-term scenarios that account for the cumulative effects of climate change and are informed by coherent adaptation policy narratives.

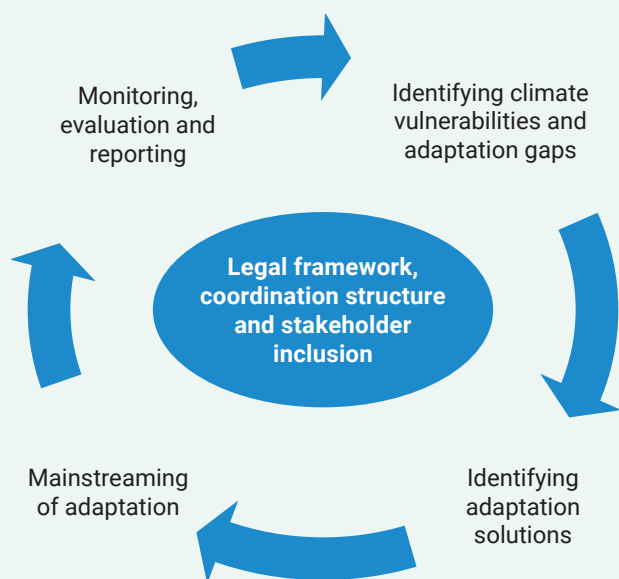
THE IMF’S THREE-PILLAR APPROACH TO CLIMATE ADAPTATION

Identification of climate vulnerabilities and adaptation gaps aids in stock-taking of climate change impacts, planning, and development of roadmaps for National Action Plan (NAP) processes and their implementation. Adaptation needs to be mainstreamed into public financial management (PFM) through national planning, incorporating climate risk management, adding estimated adaptation needs to the budget and financing plans, and enhancing the implementation capacity. Progress monitoring, re-evaluation, and regular updating of adaptation plans are also necessary.



Photo: Nikada/iStock

Figure 2. Adaptation Plan Structure



Source: Reproduced from Figure 2 in IMF (2022).⁷

The IMF's three-pillar approach to guide the identification of adaptation options can also be considered for Africa.⁸ The three pillars include prevention, alleviation, and macro-fiscal resilience:

- **The prevention pillar** focuses on public goods and incentives to facilitate adaptation and reduce climate risks and their impacts. Provision of information on risks, accurate pricing of risks, and provision of infrastructure and new technologies can incentivize agents for efficient resource allocation.
- **The alleviation pillar** focuses on improving the efficiency of policies to alleviate residual risks. This includes disaster contingency plans to ensure post-disaster support and reconstruction, financial inclusion, and reliable social safety nets to cope with residual climate risks.
- **The macro-fiscal resilience pillar** creates financial strategies for macro-fiscal resilience to residual climate risks and ensures sustainable and timely financing of adaptation policies. Inclusion of climate costs into macro-frameworks helps

develop effective financial strategies that mobilize necessary resources for adaptation policies. It also serves as insurance against large risks and secures timely access to liquidity post climate disasters.

The IMF recommends a combination of structural protection and financial protection as an optimal resilience-building strategy. The identification, quantification, inclusion, and disclosure of fiscal risks from climate change would help guide policymakers and the public in planning and implementing adaptation policies and their management.

In addition, it is important to finance priority interventions across sectors, income, and population groups based on a society's preferences on goals and distributional outcomes in a way that maximizes social welfare.

To keep the cost of adaptation to a more affordable level, the IMF recommends monitoring the country's infrastructure asset conditions and their vulnerability to climate shocks. This will ensure efficient selection, execution, and maintenance of adaptation investments. The relocation and rebuilding of some assets currently located in areas facing overwhelming climate risks may be needed in certain situations.

Domestic revenue mobilization, reprioritized investment plans, and donor community support are required to finance adaptation costs, among other sources. Climate adaptation investment is a cost-effective alternative for international donors compared to disaster relief, as it can minimize climate change risks before they materialize, resulting in a net reduction of total spending.

As climate change is dynamic, adaptation should not be considered a one-time adjustment for African countries. Rather, new investments should be designed with the flexibility needed to respond to new climate conditions, despite the uncertainty of the specific magnitude of future shocks. Governments can start accumulating knowledge and experience in dealing with present challenges and can consult climate scientists for climate change projections to interpret and adapt available knowledge to the local situation.