



STATE OF ADAPTATION IN AFRICA

REPORT 2022 (SOAR22)

Summary of the key findings



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Acronyms

ACRE	Agriculture and Climate Risk Enterprise
AfCFTA	African Continental Free Trade Area
AGN	African Group of Negotiators
AMCOW	African Ministers' Council on Water
AWF	Africa Water Facility
AWV	Africa Water Vision
BCC	Benguela Current Commission
BMZ	The German Federal Ministry of Economic Cooperation and Development
CAADP	Comprehensive Africa Agricultural Development Programme
CECAF	The Fisheries Committee for Eastern Central Atlantic
COMHAFAT	Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic Ocean
COREP	Regional Fisheries Committee for the Gulf of Guinea
CPI	Climate Policy Initiative
CRM	Comprehensive Risk Management
DFI	Development Finance Institutions
FCWC	Fishery Committee of the West Central Gulf of Guinea
GCF	Green Climate Fund
GDP	Gross Domestic Product
ICCAT	International Commission for the Conservation of Atlantic Tunas
IDF	Insurance Development Fund
IDFC	International Development Finance Club
IPCC	Intergovernmental Panel on Climate Change
KCB	Kenya Commercial Bank
LBA	La Banque Agricole
LDCF	Least Developed Countries Fund
NAPs	National Adaptation Plans
NbS	Nature-Based Solutions
NDCs	Nationally Determined Contributions
NEPAD	New Partnership for Agricultural Development
RWSSI	Rural Water Supply and Sanitation Initiative
SEAFO	South East Atlantic Fisheries Organization
SMEs	Small and Medium-Sized Enterprises
SRFC	Sub-Regional Commission on Fisheries
SSA	Sub-Saharan Africa
TFCAs	Trans frontier Conservation Areas
TVET	Technical and Vocational Training
UNDP	United Nations Development Programme
UNFCCC	United Nations Framework Convention on Climate Change
WACA ResIP-CCA	West Africa Coastal Areas Resilience Investment Project for Climate Change Adaptation

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Introduction

The urgency of adaptation in Africa

For the period 1990–2010, Africa’s GDP per capita was on average 13.6% lower than it would have been if human-induced climate change had not occurred.

Climate change is already affecting Africa and is projected to worsen. The 6th Assessment Report (AR6) of the Intergovernmental Panel on Climate Change (IPCC) notes that Africa is warming faster than the rest of the world. Africa’s vulnerability to climate risks is compounded by factors such as high levels of poverty, a high number of people lacking access to basic services, and governance challenges, as well as wealth and gender inequalities. The IPCC also highlighted additional risks in Africa from heat-induced food insecurity due to reduced crop production. The livelihoods of 53% of the Sub-Saharan African labor force are under threat, as these rely on agriculture, which is mainly rainfed. In 2020, more than 1 in 5 people in Africa faced hunger, which is double

the proportion in any other region. Climate change is preventing food security in Africa and is interacting with other stressors, such as inequality, reduction in natural resources, conflict, and COVID-19.

Climate change will likely affect African Economic growth. Africa’s economic growth has already been affected by climate change. According to the IPCC, from 1990 to 2010, Africa’s GDP per capita was on average 13.6% lower than it would have been if human-induced climate change had not occurred (Figure 1). African countries are also projected to experience an 80–89% decrease in GDP per capita in a 4°C warming scenario compared to a scenario without global warming after 2010.

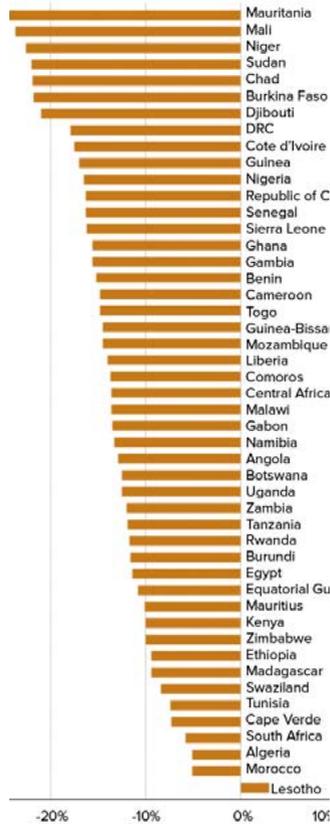


Figure 1: Percentage change in African countries' GDP per capita between 1991 and 2010, due to observed climate change. On average, GDP per capita in Africa has shrunk by 13.6% between 1991 and 2020, with some countries such as Mauritania and Mali experiencing nearly 25% losses in GDP per capita over this period. Source: IPCC, 2022.

Covid-19 has accentuated the continent's vulnerability to climate change. Responses to Covid-19 by African governments and their partners have demonstrated the possibility and importance of decisive action to manage risks but have also put strains on public budgets. Pre-pandemic, most African economies were already

facing massive deficits and pressures due to slow and quick onset climate events. These weaknesses have been exposed and made worse by the pandemic for both climate-vulnerable and development-critical sectors, including agriculture.

The urgent need for adaptation

The IPCC 6th Assessment Report outlines that the implementation of adaptation has received limited attention globally. A transition to implementation of African countries' NDCs and NAPs, which centers on sustainable development, is paramount in order to reduce compounding risks and vulnerabilities.

Adaptation planning is an important process for countries to assess their climate risks and identify adaptation priorities. As of October 2022, only thirteen African countries have submitted their National Adaptation Plans (NAPs) to the UNFCCC. The majority are still working towards developing their NAPs or other plans and policies that emphasize their adaptation needs and communicate the required resources for achieving their adaptation goals. Countries have sought funding from the Green Climate Fund (GCF) and the Least Developed Countries Fund (LDCF) to acquire resources for enabling the NAP development process. As of 2021, 47 countries had submitted proposals to these two institutions (40 to the GCF and 7 to the LDCF), with 33 having already been approved.

Despite these ongoing national and international efforts in responding to climate change, including through planning, African countries are still experiencing a large climate financing gap. Africa's annual climate finance needs for meeting NDC goals between 2020 and

2030 are estimated at US\$277 billion. However, Africa only receives US\$29.5 billion, which is only 11% of climate finance needs, representing an 89% climate financing gap. This gap is attributed to several factors, including the high levels of vulnerability, the levels of capacities and resources available to address these vulnerabilities, the dwindling grant-based financial resources to support adaptation and the high level of climate risks and exposure.

The policy-implementation gap, which occurs when countries make plans for adaptation but are unable to effectively implement them, is particularly high. Various factors, including insufficient resources and the absence of enabling conditions such as institutional implementation capacities, have been reported as the main cause of this policy-implementation gap. Therefore, ongoing planning processes should be accelerated to transition African countries from adaptation planning to implementation. The need to transition is made pressing by the urgency of climate change and the need to achieve meaningful progress in vulnerability and risk reduction. Post-2022 discussions on climate change at the international and national levels are therefore expected to have a stronger focus on how countries can make progress in the implementation of adaptation.

Purpose and scope of this report summary

While there is an increasing interest in mapping out the state of climate action and more specifically its adaptation in Africa, there is a need to recognize and highlight continental progress made over the past years in advancing adaptation action. Post-2022 climate action requires that African state and non-state actors reflect on how the continent can accelerate its progress towards implementation of adaptation, based on the lessons learned from current experience. As one of its objectives, the Global Stocktake process under the UNFCCC is expected to focus on whether countries have made sufficient progress on the implementation of adaptation action to meet the Paris Agreement goals. Progress on the implementation of national adaptation plans will also be used to inform the global goal on adaptation.

The present summary provides the directions for a more detailed main report which is expected in 2023. The summary and the forthcoming report, therefore, focus on the lessons learned, and good practice in the implementation of adaptation across Africa. The focus of this report is placed on three thematic

areas—climate finance for adaptation, technology for adaptation and risk transfer, cutting across sectoral areas to consider the adaptation in the agricultural and water sectors, and adaptation in coastal zones. By focusing on these themes, the report identifies sectoral and thematic gaps and needs for the implementation of adaptation in Africa and sets out an agenda for action for further progress on climate action in Africa through implementation.

This report is prepared for the attention of African Heads of State, the African Group of Negotiators (AGN), decision- and policymakers, and other relevant African climate and development stakeholders to inform on progress made on the continent regarding adaptation and the increased momentum for an expedited focus on implementation.

Climate finance for adaptation

Adaptation needs are high in Africa, but most remain unquantified

1. Quality means that funds are available in the right volumes to meet the needs of countries, as expressed in countries' communications to the UNFCCC. However, not all countries have quantified targets for climate finance, meaning that they would need support to comprehensively quantify their financial needs. Quality of finance relates to the channels through which the finance is delivered, and the terms of delivery. These channels can include international dedicated climate finance mechanisms, bilaterally or through multilateral development banks, all of which have different access requirements. Terms of delivery depend on whether this finance is debt- or grant-based. The Paris Agreement requires that developed countries strike a balance between loans and grants when meeting the US\$100 billion/year by 2020 climate finance target. Debt-based finance is also expected to be delivered in mostly concessional terms.

Between 2014 and 2018, adaptation-related finance committed by bilateral and multilateral funders to African countries was US\$5.5 billion per year, which is well below the estimates of adaptation costs in Africa. This represents roughly US\$5 per person per year. However, it should be noted that quantifying adaptation finance flows is constrained by data availability, data consistency, and methodological challenges. Adaptation finance is also subject to self-reporting challenges, where reporting of the attribution of financial support to climate adaptation objectives is subjective. This judgement is made by bilateral and multilateral funders and is not independently verified. All these challenges have meant that a comprehensive quantification of adaptation finance flows is challenging.

Finance for adaptation in Africa falls short in both quantity and quality. First, finance for adaptation has been well below the level of finance needed. For example, adaptation-related finance committed by bilateral and multilateral funders to African countries was US\$5.5 billion per year, which is well below the estimates of adaptation costs in Africa. International adaptation finance flows to Africa remain very low in comparison to flows in other regions.. For example, although two-thirds of the Least Developed Countries are in Sub-Saharan Africa (SSA), these countries only accounted for 5% of non-OECD climate-related financial flows in 2017-2018. This is less than funds directed to East Asia and the Pacific, Latin America and the Caribbean, and South Asia. A report by CPI in 2021, however, noted that Sub-Saharan Africa was the largest recipient of international adaptation finance flows in 2019-2020. Additionally, more adaptation-related finance was provided as loans (57%) than grants (42%) and half the adaptation finance targeted just two sectors: agriculture, and water supply and sanitation. However, the Covid-19 pandemic did not affect international climate finance flows, as assessments found that total international climate finance saw a marginal

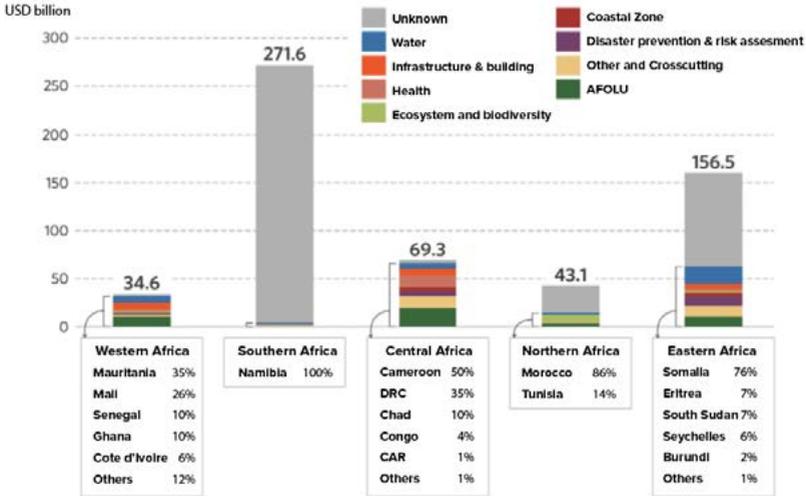


Figure 2: Climate adaptation finance needs of African countries as expressed in NDCs. Source: CPI, 2022.

increase from 2019 to 2020 by US\$2 billion. The International Development Finance Club (IDFC) member institutions from Africa reported a 73% decrease in 2020 adaptation finance allocations in comparison with the 2019 values.

African countries' NDCs indicate that these countries will need US\$579 billion between 2020 and 2030 to implement the adaptation needs identified in these NDCs. This represents nearly a quarter of the total climate finance needs for African countries to meet NDC targets.

The socio-economic benefits of investment in adaptation and resilience are very high. Every dollar invested in adaptation can result in up to US\$10 in net economic return.

The total adaptation finance needs are only 24% of the total climate finance needs identified in African countries' NDCs. See Figure 2 for regional breakdowns of adaptation finance needs. However, these adaptation finance values are likely to be underestimates. This is because most NDCs lack quantitative estimates of adaptation finance. Countries also lack the data and technical expertise to generate comprehensive estimates of their adaptation finance needs. African countries need these accurate estimates, which can then be used to set national and international ambitions for the mobilization of finance. African governments have expressed the preference that a significant proportion of adaptation finance to the continent should be delivered as grant funding as opposed to debt-based financing,

Domestic finance is playing an important role in funding adaptation.

African countries' expenditure on adaptation ranges from 2 to 9% of their GDP, with countries that have lower GDP and those that experience higher climate change risks spending more on climate change adaptation.

In 2017, 20% of public expenditure by African governments was funding for adaptation.

In total, US\$264 billion of climate finance needs will be covered using domestic public resources, which represents about 10% of the total cost of climate change action in Africa. All African governments have been committing or allocating their own resources for climate actions. In its revised NDC submission, the government of Rwanda committed to raising US\$2.1 billion for its NDC adaptation goals through domestic sources, which is 40% of the total required amount. Kenya's revised NDC submission noted that most of the achievements in its initial NDC were made based on domestic finance sources. In South Africa, 75% of total public climate finance which was tracked by the Climate Policy Initiative (CPI) for the 2017-2018 period was generated from domestic sources. For the 2016-2018 period, the Zambian Government's climate expenditure was US\$139 million, with 0.05% of this coming directly from domestic public resources. However, current estimates of domestic climate finance mobilization remain largely unquantified because of methodological issues.

Sources and channels of domestic adaptation finance include government budgets, dedicated national climate or environmental funds, the domestic financial system, and to a lesser extent, local governments, are being mobilized to provide climate finance. Domestic resource mobilization for climate change including

adaptation has partly been driven by government commitments to allocate proportions of their domestic budgets to climate change adaptation projects. However, the allocation of domestic finance towards adaptation has also been driven by the need for national governments in Africa to meet urgent adaptation needs emerging from climate change risks.

National climate change funds have been successful in channeling climate finance to priority adaptation sectors and projects, ensuring coordinated approaches to financing adaptation by limiting fragmentation and increasing country ownership of climate finance. For example, Algeria, Rwanda, Benin, and Burkina Faso have set up national climate change funds that aggregate national and international finance and direct it to climate change adaptation sectors and projects. These funds are sought from domestic and external sources of finance. A common feature of these funds is that they are embedded in national policies and structures.

National financial institutions across the continent are also positioning themselves as adaptation implementation entities. Attijariwaffa Bank group from Morocco, CRDB Bank in Tanzania, Ecobank Ghana, the Kenya Commercial Bank (KCB), and La Banque Agricole (LBA) in Senegal have all received approval to implement the Green Climate Fund (GCF) adaptation projects in Africa.

Finally, sub-national governments and national financial institutions are also becoming involved in funding adaptation in Africa. In Kenya, County Governments have started issuing municipal bonds for infrastructure development.

Poor and highly vulnerable African countries need more readiness finance to enable them to access international adaptation finance for concrete action

Adaptation finance is not equitably distributed across Africa. Highly vulnerable countries, such as countries in Central Africa, receive less finance than the rest of the continent and therefore need readiness finance to mobilize international climate finance. Poorer countries need more readiness finance to access international adaptation finance. More than half of all climate finance investment in Africa is absorbed by only ten countries (Egypt, Morocco, Nigeria, Kenya, Ethiopia, South Africa, Mozambique, Cote d'Ivoire, Tunisia, and Ghana).

The largest climate investment gaps as a percentage of GDP are in Central and East Africa, 26% and 23% on average, respectively.

The AfDB's Africa Economic Outlook for 2022 noted that countries that are less resilient to climate change risks are also those that are found to exhibit less climate readiness i.e. not only less able to implement climate change policies, but also less able to receive international climate finance. In return, countries that have received comparatively less international adaptation finance are more likely to exhibit deficits in the capacity that is needed to develop project funding proposals for international climate finance mechanisms. Geographical equity in the climate finance allocation is limited across Africa. Countries that are most vulnerable

to climate change risks, such as those in Central Africa, have received comparably less finance than the rest of the continent. Current patterns of implementation of climate change adaptation projects across the continent lack spatial equity, where countries with higher levels of vulnerability have fewer adaptation projects being implemented in them. As more funding is needed to address adaptation, institutions on the continent will not only need greater capacity to access funding for implementation, but also to access funding at the required scale to address the needs.

African countries, therefore, need more readiness finance, which can then be used to finance processes that strengthen institutional capacities for mobilizing international climate finance. International readiness finance should be used to increase countries' capacity to identify finance needs, access international finance for the implementation of adaptation, channel finance to sectors and places that are vulnerable, and monitor, report, and verify the allocation and performance of the financing. The readiness of countries can contribute towards reducing the spatial inequities observed from the distribution of climate finance. International finance mechanisms need to allocate more finance to countries that are highly vulnerable but have limited readiness for climate finance.

Technology development and transfer

Technology can accelerate adaptation in Africa.

The Technology Needs Assessments of African countries and Nationally Determined Contributions identify technology needs relating to farm system management, water system management, early warning, and the need for hard and soft infrastructure. Countries' NDCs emphasize the need for technology.

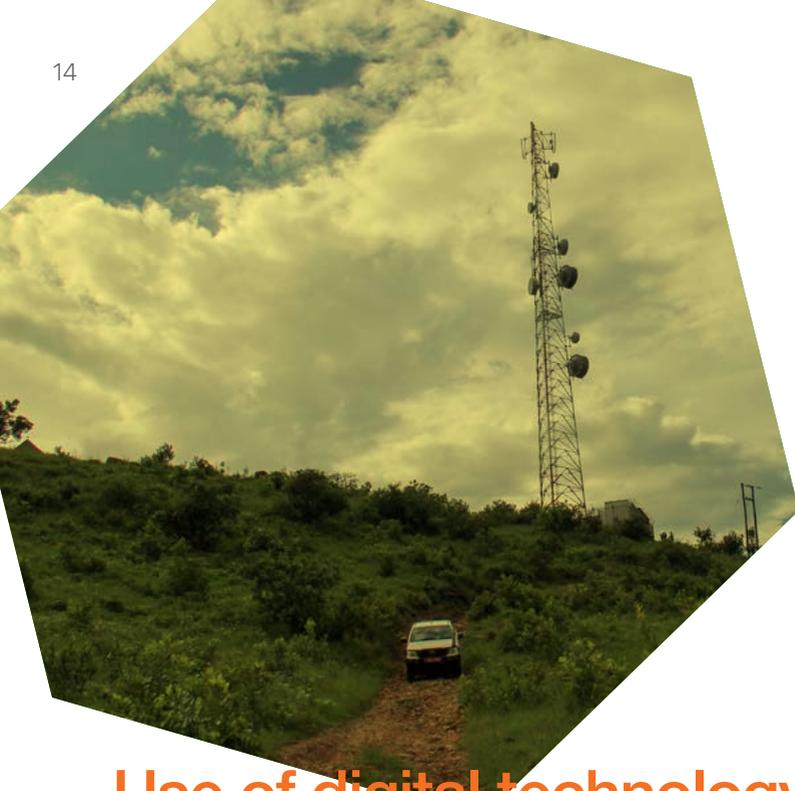
The absence of appropriate technology can limit the ability of adaptation actions to be fully effective. African countries' NDCs emphasize that their development and climate goals cannot be reached without sufficient technology development and use, particularly in relation to water management, agriculture, and in enabling early warning. Technology transfer is mentioned as a conditional requirement for the achievement of many NDC goals, alongside climate finance and capacity building. Approximately 69% of NDCs identified technology as extremely important and very urgent for effective climate action in Africa.

Technology development and transfer as well as access to available technologies for adaptation are still low in Africa. Between 1980 and 2009, there were 56 adaptation technologies developed and patented in Africa between 1980 and 2009. Most of these technologies targeted sectors

and themes with relevance for adaptation such as water desalination, water supply in remote locations, solar water treatment, rainwater collection, and solar- or wind-powered pumping of water.

However, less than 1% of the world's patents for adaptation are registered within African patent offices. Adaptation technologies bear the potential to be further structured and protected for large-scale deployment in Africa.

Most adaptation technology used in Africa is unpatented and remains unformalized. Although the number of adaptation technologies that are patented has increased, the numbers do not correspond to the increase in adaptation technology innovation that has been observed over the past few decades, with most new patents for adaptation mostly being registered in Europe and Asia. African countries are still behind in patenting adaptation technology. Patenting of adaptation technology enables cheaper and quicker technology deployment and replication across the continent without having to overcome difficult hurdles relating to intellectual property.



Use of digital technology in adaptation is expanding across Africa.

Every dollar invested in ICT is reported to generate US\$20 in GDP across Africa. The economic benefits of digital technologies will be useful for enabling adaptation. Countries have invested in platforms for the development of digital skills, with other countries enhancing their provision of digital skills through Technical and Vocational Training institutions.

Climate change risks are becoming severe and increasingly complex. Understanding these risks and developing adaptation tools and instruments will require sophisticated tools that are able to capture data, help in analysis, and to inform decision-making in adaptation.

Digital technologies have proven to be essential for adaptation globally, but particularly on the African continent. As climate change effects are exacerbated, communities rely on digital technologies to implement emergency measures, accessing information that is used to inform decisions to protect lives and assets and to inform long-term decision-making on climate change risks. For example, mobile phones, which leverage digital technology, have been used in many parts of Africa to transfer information on climate risks to enable disaster responses and to communicate with farmers to enable adaptation mechanisms in the agricultural sector. The absence of sufficient availability of digital technology

has also been cited as one of the barriers to climate change adaptation in the health sector. For example, lack of access to digital technology in West Africa is cited as hampering the effective management of malaria outbreaks, which have become more common as a result of climate change.

Digital technologies have also had a significant positive effect on the African economy. Every dollar invested in ICT is reported to generate US\$20 in GDP across Africa. This will generate income and employment, particularly for the youth sector. The African Union's Digital Transformation Strategy for Africa for 2020-2030 recognizes the importance of investments in digital technology and therefore encourages countries to enhance investment in these technologies while simultaneously addressing barriers to digital development such as skills gaps. Income from digital technologies can therefore be invested directly in climate-sensitive sectors, such as agriculture and forestry.

Although the number of young people on the continent with digital skills has increased over the past decade, this figure is still at levels that are insufficient to meet the increased demand for technology and innovation within the growing economies. For example, only 29% of workers in Africa are qualified for their jobs, meaning that the rest is either over- or under-qualified. While this indicates a large employment satisfaction gap within the African workforce, it also means that there is scope to match skills with the work requirements to boost productivity.

The African workforce will need digital skills such as computer literacy, web research, and accessing online government services as well as intermediate digital skills such as data analytics and digital marketing. The demand for these skills is expected to grow, but there is still a lack of investment focused on delivering training for these skills. The growth in digitization and automation, particularly in the agriculture and services sector has resulted in prospective economic growth that will generate increased demand for digital skills. Over 230 million jobs in Sub-Saharan Africa will require digital skills by 2030, thus requiring that African countries enhance their provision of training opportunities to meet this need.

There is a need for further investment in the development of digital skills, particularly amongst the youth sector, whose proportion of the total population is growing, and their demand for employment and income expanding rapidly. Infrastructure, i.e., the availability of energy to power digital systems and internet connectivity, is not only relevant for digital skills but also for climate change adaptation. Technical and Vocational Training (TVET) institutions can be used to advance the development of adaptation-related digital skills within their populations. For example, digital training can be embedded into courses offered to water, energy, and construction technicians who can then apply these skills to adapt existing technologies or develop new ones that can be used in their respective sectors.

African countries need to leverage the growing risk appetite in innovation and technology for adaptation

Africa has seen a steady private sector-driven increase in the adoption of technology relevant for adaptation in the communication, financial and agricultural sectors. Mobile SIM connections are expected to increase from 930 million in 2020, to 1.12 billion by 2025. The year 2020 saw the greatest annual increase with over 33 million new users connected to the internet, bringing total usage to 300 million. Digital technology contributes not just to economic development; but offers great potential to respond to climate risks across sectors such as health, education, and agriculture. Private equity funds and small investors have been the greatest contributors to the development and deployment of technology for adaptation on the continent. For example, the Covid-19 pandemic spurred the establishment of healthcare technology operations in different countries to address the gaps in healthcare service provision. As of 2021, more than 60 start-ups were operating in the healthcare sector, for example by expanding services to include telemedicine. Applications to adaptation in critical sectors have a similar potential to grow with the right incentives.

With the right regulatory and enabling environment, increased investments in innovation and technology can be directed toward advancing the implementation of adaptation.

Africa is deemed to be a future technology superpower. The growing population and potential for economic growth and development are already attracting interest from international investors seeking markets for their innovations and technologies. This investment appetite in the African market is already visible. Data shows that the number of start-ups in Africa has rapidly increased over the past decade. In 2021, Africa received US\$4.9 billion in new investments, with 62% of these funds going towards financial technology, followed by 8% towards health and biotechnology. This also represents an almost 200% increase in investments from 2020, coming after a steady increase over the previous 10 years.

Small and Medium-Sized Enterprises (SMEs) presents an important opportunity for African countries to drive investments in technology deployment, particularly towards the deployment of technologies

that can accelerate the implementation of adaptation, such as in the agricultural sector and provision of financial services solutions to reduce vulnerability and increasing resilience. However, achieving this means that sufficient efforts need to be directed to: (a) developing appropriate regulatory environments for the development and growth of SMEs, and (b) Capacity gaps within individual SMEs be addressed, including both technical capacity as well as financial gaps.

Examples of regulatory environments to spur SME development and growth include the use of sandboxes, which refer to environments created by governments for allowing entrepreneurs, regulators, and other technology stakeholders to test out new technological products without the limitations of existing regulations within those jurisdictions that would hamper progress (ref). Regulatory sandboxes can be used to: (i) Facilitate partnerships between technology developers and other stakeholders in the ecosystem, (ii) Encourage innovation by creating spaces for the development and testing out of products without the limitations of regulations, and encourage competition by enabling new entrants into the market, (iii) Encourage greater coordination between technology developers and regulators, thus generating an evidence-base for regulation, and (iv) Enable market growth by introducing new technological solutions into the market.

Sandboxes have been used globally to nurture new businesses and technologies, and have recently started being used in Africa. As of 2021, 6 sandboxes had been created in Africa (in Kenya, Mauritius, Mozambique, Nigeria, Rwanda, Sierra Leone, and South Africa), focusing on the financial technology sector. These sandboxes can be developed to enhance the development of technology to address technology needs in different contexts. For example, countries can create regulatory sandboxes to develop technologies that address water scarcity issues, or that help countries accelerate progress in adaptation by the agricultural sector. The country's leadership can ensure in these uses that technology development, deployment, and use are aligned with NDCs and NAPs. As these have already been tested out in several countries in Africa, the only requirement will be the political will at the national level.

Comprehensive risk management

Rising climate risk threatens development in Africa.

African countries need comprehensive risk management mechanisms amidst the increasing climate change risks.

Climate change is expected to result in extreme events that are frequent and severe that exceed countries' capacity to prepare and respond to these risks by themselves. In most countries across the continent, if extreme droughts were to occur successively for a few years, then these countries would be unable to protect the populations of the places that are most affected by these droughts. The exposure of people, assets, and infrastructure to climate hazards is increasing in Africa, exacerbated by the deficit in infrastructure, and by population growth in informal settlements.

Droughts and floods have the greatest effect on people and livelihoods in Africa. Five times more people are affected by droughts than by floods. However, floods cause greater financial damage. From 2005 to 2020, flood-induced damage in Africa was estimated at over US\$4.4 billion, with East and West Africa being the most affected regions.

Comprehensive Risk Management (CRM) approaches are needed for African countries to effectively respond to the multiple climate change risks. CRM is designed to strengthen the synergies between the reduction of risk from disasters while also supporting adaptation and mitigation of climate change, as well as sustainable development. This means that all the responses to extreme climate risks aim to achieve these different objectives.



Africa has an expanding regional sovereign and national risk transfer landscape

The sovereign risk transfer landscape in Africa is solidifying with increasing collaboration between national governments, domestic and international private sectors, and other international development partners.

The continent today enjoys concrete examples showing a solidifying risk transfer landscape in response to climate change. However, finance provided through current sovereign risk transfer mechanisms remain largely insufficient to meet the costs of both slow-onset and quick-onset extreme events that governments face. An example of ongoing efforts on sovereign risk transfer is African Risk Capacity and the Tripartite Program. These are briefly discussed below.

African Risk Capacity (ARC) is currently the main institution mandated to support sovereign risk transfer mechanisms in Africa. ARC Ltd offers complimentary risk pooling and risk transfer services. ARC Ltd pools aggregate risks from across the continent each season to take advantage of the natural diversity of weather systems. As a continental risk pool's exposure to covariant risk would be significantly smaller than a given country's exposure, an ARC pool could manage climate risk for lower funds than if each country were to allocate a contingent reserve or approach the insurance market individually. Between 2014 and 2022, 16 African countries have participated in risk pooling at least once.

ARC, through its financial affiliate ARC Ltd has provided drought and tropical cyclone insurance coverage of US\$900 million, protecting over 90 million people. ARC has also made payouts of up to US\$124 million to 10 countries following droughts and tropical cyclone disasters. Since 2014, over 72 insurance policies have been signed by Member States for the protection of over 100 million vulnerable people in the participating countries.

The Tripartite Program between the United Nations Development Programme (UNDP), the Insurance Development Forum (IDF), and the German Federal Ministry for Economic Cooperation and Development (BMZ) brings together three leading institutions in the Climate Risk financing space to develop a series of meaningful and effective climate risk financing and insurance programs to help the populations of countries in need of increased financial resilience against the impacts of climate risk and other natural hazards.

The national risk transfer landscape in countries is also expanding, through the adoption of a variety of risk transfer mechanisms. Countries such as Algeria, Gabon, Malawi, and Morocco have adopted different types of risk transfer instruments, ranging from mandatory insurance to compulsory and voluntary subsidized coverage. African governments are using different insurance schemes,

and financial solutions such as weather derivatives contracts, to cover disasters related to climate risks with a focus on the agricultural sector. (Micro) insurance programs aim to reimburse the smallholder's farmer's credits in the event of agricultural losses. Generally, States fund the insurance schemes – for example through subsidies and fiscal incentives – and provide their guarantee to the local (re) insurers who bear the risks.

An example of national insurance mechanisms is the Uganda Agriculture Insurance Scheme (UAIS) which was established in 2016 and is supported by the Government of Uganda in partnership with the Uganda Insurers Association, which is a coalition of 13 insurance companies licensed to underwrite agriculture insurance in Uganda. The country-wide scheme provides insurance premium subsidies to farmers of 30%, 50%, and 80% depending on whether

they are large-scale or small-scale farmers, or in disaster-prone areas, respectively. The scheme sold 225,000 policies in 2020, compared with 25,000 in 2017, indicating a rapidly increasing rate of uptake of these products. The confidence provided by the new insurance scheme has led smallholders to invest more in seeds, tools, and labor.

The existing sovereign and national risk transfer mechanisms are not sufficient on their own, to address the level of risk comprehensive risk management needs for countries on the continent. The need for comprehensive risk management will also continue to increase as climate change risks rise. African countries need to leverage other mechanisms for comprehensive risk management, such as those that implement risk layering through social protection mechanisms.

African countries should further leverage their risk-pooling capacity and enhance social protection

Finance provided through current sovereign risk transfer mechanisms is insufficient to meet the costs of both slow-onset and other extreme events that governments face. African countries can explore their risk pooling potential at both the continental, regional and national levels. In addition, Africans need to explore and further support social protection programs that benefit local communities that are most affected by risks.

Awareness of the threat posed by climate-related risks to the African States has led to the development of various risk transfer mechanisms, including insurance. Sovereign risk pooling needs to be scaled across the continent. The risk pooling potential in Africa is large, mainly due to a large number of countries on the continent. If all African countries signed up for a single pool scheme, then the amount of finance raised would be sufficient to enable the transfer of resources to

countries to meet the costs of disasters. This level of risk pooling can be achieved in two ways. The first is to encourage African countries to sign up for a sovereign risk transfer program. The advantage of this is that climate risk would be equitably distributed across the continent, and if designed equitably, would allow the least developed countries to benefit from this solidarity pool.

Another way is through merging all the other existing regional and cross-continental risk pools, which would bring all participating countries into one umbrella pool. Unlike the first option, which would need to deal directly with African country governments, this second option would engage with the actors running these regional and cross-continental schemes. The success of both recommendations depends on countries' and development partners' view of solidarity, and the ability of existing mechanisms to be sufficiently flexible to meet the risk transfer needs of all the countries on the continent. In practice, each of these pathways has several political and economic implications, which must all be considered, and decisions taken at the national level. Maximizing the risk pooling potential for the African continent can also be achieved through international donor support. International donors would provide concessional risk finance to regional and continental risk pools.

However, although insurance, including sovereign risk insurance, is an optimal tool for responding to low-frequency and high-impact risks such as droughts, it may not be sufficient for high-frequency high-impact risks such as floods in certain places. Other financial risk management tools such as contingent credit may therefore be useful for such events. Instruments of this nature ensure

that countries leverage approaches that generate risk layering to protect different sections of their economies. Risk pooling and risk-layering mechanisms adopted by African countries require their design to be strongly aligned with adaptation goals while being pro-poor. It is therefore essential to ensure that the tools used, particularly at the national and local levels, are embedded in public financial management systems to reach households and communities that are particularly affected by disasters.

Although the risk insurance mechanisms presented here have been critical in enabling African countries to respond to climate change risks, these are not sufficient on their own. African countries need to engage in comprehensive risk management approaches that integrate risk insurance with other mechanisms and that engage in risk layering, where climate change risks are broken down into different layers, and where different types of risks are covered by different risk transfer mechanisms.

Risk-responsive social protection programs will be important for channeling the finance generated from regional risk pools toward populations that are affected by climate change risks. This can either be done through directly distributing financial support to these groups, or through investment in social and physical infrastructure that helps communities become more resilient to climate change risks. This accordingly requires that countries develop plans for the provision of support or the restoration of critical infrastructure in the wake of extreme climate events. The combined use of risk insurance and social protection mechanisms represents risk layering approaches.



Adaptation in the agricultural sector

**Climate change is limiting agricultural
productivity in Africa.**

Agricultural productivity growth in Africa has been reduced by 34% since 1961 due to climate change exhibiting limits to adaptation.

Climate change negatively impacts farming systems' productivity across Africa. Climate change directly impacts crop yields and indirectly impacts water availability and quality, pests, and diseases. The yields of staple crops such as maize, wheat, sorghum, and fruit crops have been decreasing right across Africa, thus impacting food security, nutrition, health, livelihood, and living conditions. Each drought or flood on the continent has resulted in a 5-20% decrease in food security. In most places in Africa, the threat to agricultural productivity means the slowing of progress toward addressing poverty and achieving development targets. In Africa, agriculture contributes to 30-40% of the GDP, 57% of the GHG emissions, and employs between 55-62% of the people in Sub-Saharan countries.

The IPCC 6th Assessment report (IPCC AR6) further highlights the risk to agriculture from climate change. It reports that agricultural productivity growth in Africa has been reduced by 34% since 1961 due to climate change, more than any other region. Further future warming will negatively affect food systems in Africa by shortening growing seasons and increasing water stress. Global warming of above 2°C will result in yield reductions for staple crops across most of Africa compared to 2005 yields. Marine and freshwater fisheries are also at risk, if 1.7°C global warming is reached, this will result

in reduced fish harvests which could leave 1.2-70 million people in Africa vulnerable to iron deficiencies, up to 188 million to vitamin A deficiencies, and 285 million to vitamin B12 and omega-3 fatty acids by mid-century.

IPCC AR6 clearly outlines that increasing weather and climate extreme events have exposed millions of people to acute food insecurity and reduced water security, contributing to humanitarian crises where climate hazards interact with high vulnerability. As flood and drought-related acute food insecurity and malnutrition increase in Africa, climate and weather extremes are increasingly driving displacement, inequity, and marginalization linked to gender, ethnicity, low income, or combinations thereof, especially for many indigenous peoples and local communities. In rural areas, this vulnerability is heightened by compounding factors such as high emigration, reduced habitability, and high reliance on climate-sensitive livelihoods. Many countries note the importance of integrating agriculture into sectoral strategies, with most needs identified relating to those of implementing agricultural adaptation actions. I



The domestic private sector has the potential to contribute to adaptation in the agricultural sector.

The domestic private sector has demonstrated its potential to contribute towards adaptation in the agricultural sector. Investments by national governments have increased the domestic private sector's contribution to adaptation in the agricultural sector.

Funding for the agricultural sector in Africa has decreased over the past 3 years, mostly driven by the effects of Covid-19 on the economy. Budgets and spending by governments in 2020 were

lower than in previous years (see Figure 3). Adaptation finance for agriculture has been directed towards initiatives such as support for knowledge generation and risk management within the agricultural sector. Although the financial instruments and resources may not always be appropriate and sufficient to address the sector's current challenges, they demonstrate the commitment of sectoral actors in supporting adaptation in the agricultural sector.



The African Union's New Partnership for Agricultural Development (NEPAD) encourages countries to enhance investment finance in Agriculture, upholding a 10% public spending target associated with its Comprehensive Africa Agriculture Development Program (CAADP). This increase in investment will enable increased finance for resilience to climate change and sector adaptation. To date, only a few countries have been able to meet this target, indicating the need to accelerate investments in the agricultural sector.

Agri-SMEs need access to affordable finance from African financial institutions including agricultural banks, commercial banks, and micro-finance institutions. Grant-based financing is needed to address the supply and demand side barriers to access to finance by agri-SMEs.

The agricultural small and medium-sized enterprise (Agri-SME) landscape, which includes farmer organizations, processors, input providers, producers, and distributors, is extensive in Africa. There are about 130,000 agri-SMEs in Africa, with a

financing demand of US\$90 billion. Only about 17% of this need is met, leaving an 83% funding gap. Although the agricultural sector accounts for 20-40% of Africa's GDP and is projected to be a US\$1 trillion industry by 2030, it is receiving less than 3% of domestic commercial credit. The share of commercial bank and non-banking financial institutional lending to agriculture ranges from 3% in Sierra Leone, 4% in Ghana and Kenya, 6% in Uganda, 8% in Mozambique, to 12% in Tanzania. Commercial finance provided by these institutions also bears high-interest rates. The cost of financing by commercial and non-commercial non-banking institutions in Africa is however a factor of the high cost and risk of financing SMEs and smallholder farmers. SMEs and smallholder farmers, on the other hand, are in most cases unable to meet the requirements for access to funding by these institutions e.g. provision of collateral and financial records.

Addressing these financing gaps requires interventions on both the supply and demand side of finance. De-risking mechanisms for agricultural financing for SMEs and smallholder farmers. Such can be based on a project-based de-risking

approach, such as the Programme for Rural Outreach of Financial Innovations and Technologies (PROFIT) in Kenya, the Livelihoods and Food Security Programme (LFSP) in Zimbabwe, and the Agricultural Financing Incentive Mechanism Support Project (ProMIFA) in Togo or the use of stand-alone de-risking institutions that have an independent and incorporated institutional form such as the Nigeria Incentive-based Risk Sharing System for Agricultural Lending (NIRSAL) and the Ghana Incentive-based Risk Sharing System for Agricultural Lending (GIRSAL). These mechanisms can also be coupled with other interventions such as farmer or SME capacity development and rural value chain development to increase the demand for financial products from local financial institutions. There is also a need for improved information flows between agri-lenders and agri-SMEs

to enable a better understanding of the market by lenders and available financing options and requirements for agri-SMEs. All of these have been instrumental in enabling finance providers to make finance accessible at the local level to support adaptation in the agricultural sector.

Such combined approaches to ensuring access to finance by agri-SMEs can be achieved through grant-financing from international finance institutions can help address these financing gaps. Part of this finance can be directed to domestic financial institutions to de-risk lending, while other financing directed towards programs that target agri-SMEs and create stronger links between agri-SMEs and financial institutions.

Innovation is driving adaptation in the agricultural sector

Innovation has driven the observed adaptation in the agricultural sector. Common innovative agricultural adaptation strategies in Africa include drought-resistant varieties of crops, crop diversification, changing the cropping pattern, and planting calendar, conserving soil moisture using suitable tillage methods, improving irrigation efficiency and afforestation, managing soil health and erosion, and improving pest control management.

Innovation will be important for enabling the successful implementation of adaptation that stays ahead of the projected climate risks and impacts. There are various examples of adaptation technology in Africa aiming at protecting the agriculture and food systems from climate impacts.

In Mali, resilient agro-pastoral practices and technologies were introduced in 2012–2013; drought-tolerant and short-cycle cereal, fodder, and rice seed varieties



were also introduced. These adaptive practices have shown the potential to improve yields and agriculture production in drought and shifting rainy seasons. In Namibia, the application of conservation tillage techniques, a concept of conservation agriculture that involves minimal soil disturbance, maximum soil cover, and crop rotations to reverse soil degradation and increase soil fertility and the soil's water-holding capacity, allows for deep root development. Conservation tillage has increasingly replaced conventional land preparation methods such as disc harrowing and ploughing worldwide.

In countries such as Malawi and Uganda which have the highest adoption of technology for agricultural adaptation, technology adoption is driven by large-scale farm input subsidies and strong dissemination efforts by service providers such as seed companies and agricultural extension services in Uganda.

The innovation that has been observed in this sector is mainly driven by local and indigenous knowledge of communities that are most experiencing the effects of climate change. Stronger adoption has been achieved through interventions that increase local farmer knowledge and awareness about climate change and required adaptation pathways. The development and transfer of knowledge e.g. through demonstration plots, field days, and distribution of print and electronic promotion materials has also been critical in fostering these innovations. Additionally, investments in technology development and deployment, e.g. the development and provision of inputs (tolerant seeds), low carbon and climate-resilient infrastructure (irrigation, storage, and other built infrastructure investments such as roads and increased facilitation to access markets (trade) has also been instrumental in advancing innovation.



Adaptation in the water sector

Climate change already affecting water security in Africa.

Climate change extremes such as droughts and floods will negatively affect the availability of water resources and will further affect key water-dependent sectors such as agriculture and freshwater fisheries, and will have impacts such as reduced agricultural productivity, human and animal health, and livelihoods.

Water scarcity is an everyday experience for many individuals and communities in Africa. It is estimated that over 400 million Africans still lack potable water, which means that they also lack sufficient water to satisfy their basic daily needs. Further, more than 700 million Africans still lack access to basic safe sanitation which is dependent on the availability of water resources in sufficient quantities and quality. In Sub-Saharan Africa, 40% of people lack basic access to water supply and 70% to basic sanitation, in addition to challenges from concomitant floods, droughts, and pollution. In urban areas of Sub-Saharan Africa, only 20% have access to safely managed sanitation and 25% to basic sanitation, with significant variations across countries. Increasing water abstraction across the continent is projected as the population increased and climate change exacerbates. Water accounted for 23% of adaptation financing in Africa and 9% of total climate

investments (US\$2.6 billion) despite being the second-highest priority sector for NDC implementation.

According to the IPCC, extreme climate change risks will reduce the quantity and quality of available water resources. This will affect multiple sectors, particularly the water-dependent sectors such as agriculture and fisheries. Water stress emerging from these extreme events will affect agricultural productivity, human and animal health, and livelihoods. Extreme droughts will increase both domestic and industrial water demand, as well as demand for water and sanitation services across both rural and urban areas. For example, most of the planned hydropower projects in East and South Africa will be in places with a projected high risk of rainfall variability, meaning that the absence of water resource management interventions will result in increasing the already high risk of water stress and scarcity.

By 2030, most parts of North Africa and some parts of Southern Africa are projected to experience an increase in water stress of 2.8 times in comparison to current water stress. The rest of the continent will experience an increase in water stress of at least 1.4 times.

Need for adaptation finance investments in transboundary water resource management in Africa.

Over 90% of surface water resources in Africa (rivers and lakes) are transboundary i.e. shared by two or more countries. Of these, 80 are transboundary water basins and 38 transboundary aquifer which are relied upon by 38% of the total population on the continent.

The management of transboundary water resources continues to remain a priority across the continent. In sub-Saharan Africa, 87% of countries share transboundary water resources, which have led to the establishment of institutional arrangements for the management of water resources through river basin organizations; additionally, river basins cover approximately 64% of the continent's landmass. Examples of river basin organizations in Africa include the Lake Chad Basin Commission, the Niger Basin Authority, and the Lake Victoria Basin Commission, all of which are guided by frameworks and strategies that are informed by local priorities. Although often orientated towards surface waters, these arrangements tend to cover groundwater interacting with the surface water of the basin within their scope. North African transboundary water resource governance

agreements include the North-Western Sahara Aquifer System shared between Algeria, Libya, and Tunisia, and the Nubian Sandstone Aquifer System between Chad, Egypt, Libya, and Sudan.

African countries should strengthen transboundary water resource management, by fully implementing regional water resource management frameworks and strengthening regional resource management institutions.

Although progress on the implementation of adaptation in transboundary water resources is recognized as important, assessments find that further integration of adaptation into the management of transboundary water resources needs to be strengthened. However, experts note that further implementation of transboundary water resource management approaches will require local actor involvement in the implementation of adaptation actions in these transboundary resources while integrating safeguard principles for conflict management. The allocation of sufficient capitalization of these institutions will also be critical in enabling them to fully operationalize their mandates.



Need for climate-resilient water resource management infrastructure to address water scarcity in urban and arid areas

Water scarcity is a grave concern for all of Africa, in both rural and urban areas. Urban areas are however more susceptible to water scarcity, where demand is high and supply sensitive to disruptions of climate and non-climate drivers. Estimates show that Africa's urban population is already high, but by 2050, nearly 1 billion Africans will be living in urban areas, up from 500 million in 2015. Currently, over 50% of Africa's urban population live in informal settlements without access to basic services (piped water, safe sanitation, health centers). As such, addressing water scarcity will require investments in infrastructure, ensuring that institutional systems are sufficient for managing demand and supply and responding to climate change risks, and ensuring

equitable access to water for different socio-economic groups e.g., women.

Countries have leveraged regional financing frameworks and tools to enable adaptation in the water sector.

One of the greatest challenges facing Africa's water sector is the insufficient infrastructure for managing available water resources, and sanitation. Africa's water use is 40% lower than that of the rest of the world, with reservoir storage being lower across Africa than in other countries across the world. Countries have leveraged regional financing frameworks and tools to enable adaptation in the water sector.

The Africa Water Facility (AWF) and the Rural Water Supply and Sanitation Initiative (RWSSI), are good examples of efforts in mobilizing resources for the water and sanitation sector for the successful attainment of the Africa Water Vision 2025. These mechanisms were conceived by the African Ministers' Council on Water (AMCOW) as special-purpose funds to assist African countries to mobilize and allocate resources to the water and sanitation sector for the successful attainment of the Africa Water Vision (AWV) 2025. This mechanism comes in addition to AfDB Funds supporting water supply and sanitation infrastructure, water and sanitation policy and strategy development, program and project preparation, and capacity development. These facilities have been instrumental in supporting African countries in implementing water resource management. However, sufficient capitalization is still required at both the regional and national levels to meet the goals of these instruments.

Financing of adaptation for water resource management is also occurring using Water Funds. Water funds leverage a mix of innovative financing models to fund water management within the basins and enable downstream users of water resources in river basins to compensate or incentivize upstream users to implement water resource governance

and conservation mechanisms that ensure the continued availability of water across the basins. Examples of water funds that have been established in Africa include the Upper Tana Water Fund (UTWF) and Greater Cape Town Water Funds in Kenya and South Africa respectively. The UTWF was the first water fund to be established in 2015 while the GCTWF was established in 2018.² Resources generated from water funds are used to fund water resource management activities such as tree planting, training of water users on effective water resource use, and in investment in integrated water resource management. Although still new, examples of the use of water funds in Kenya and South Africa represent a slow but steady movement in Africa to create coordination mechanisms across basins for the mobilization of funding and incentive mechanisms for water resource management.

Coastal zone adaptation

Coastal zones in Africa are threatened by sea level rise and storms caused by climate change.

The rate of sea level rise along the coastal parts of Africa has been higher than the global average. By 2030, more than 108 million people in Africa will be exposed to the risk of sea level rise, through increased frequency and severity of coastal flooding and the salination of groundwater sources due to seawater intrusion. Around 20% of all natural and cultural sites in Africa are at risk of a 1-in-100 coastal extreme event. The number of exposed sites increases to 60% in 2050 under an RCP 4.5 emissions scenario.

Africa has 38 coastal countries and possesses a vast network of aquatic resources and extensive interconnected oceans. The total length of Africa's coastal line is 26,000km. Already, practices with unsustainable resource use such as sand mining, water pumping, and pollution have degraded important marine biodiversity habitats and have damaged coastal resources and systems. Climate change is exacerbating these stresses. African NDCs still need an estimate of how much investment is needed for adaptation in the coastal ecosystems sector and Nature-Based Solutions (NbS).

According to IPCC, the rate of sea level rise along coastal zones of Africa has been faster than the global average. Further

sea-level rise will result in the increased frequency and severity of coastal flooding, particularly in low-lying coastal zones, and result in the salination of groundwater sources due to the intrusion of seawater. By 2030, 108-116 million people in Africa will be exposed to the risk of sea level rise, in comparison to 54 million people in the year 2000.

Africa's coastal ecosystems are highly vulnerable to sea level rise, erosion, and flooding and further warming will threaten coastal and marine tourism and coastal natural habitats and infrastructure. A 1 m rise in sea level is projected to inundate 20% of the Nile Delta's land area across Africa by 2100, while a 0.5 m rise would displace 67% of the cities' populations. Assessments show that 20% of all natural and cultural sites in Africa are already at risk of a 1-in-100 coastal extreme event. The number of exposed sites would increase to 60% in 2050 under an RCP 4.5 emissions scenario. Besides sea level rise, other climate change risks such as extreme or changing rainfall patterns are causing coastal flooding that affects sensitive coastal habitats such as lagoons, in turn leading to impacts such as dwindling fish populations.



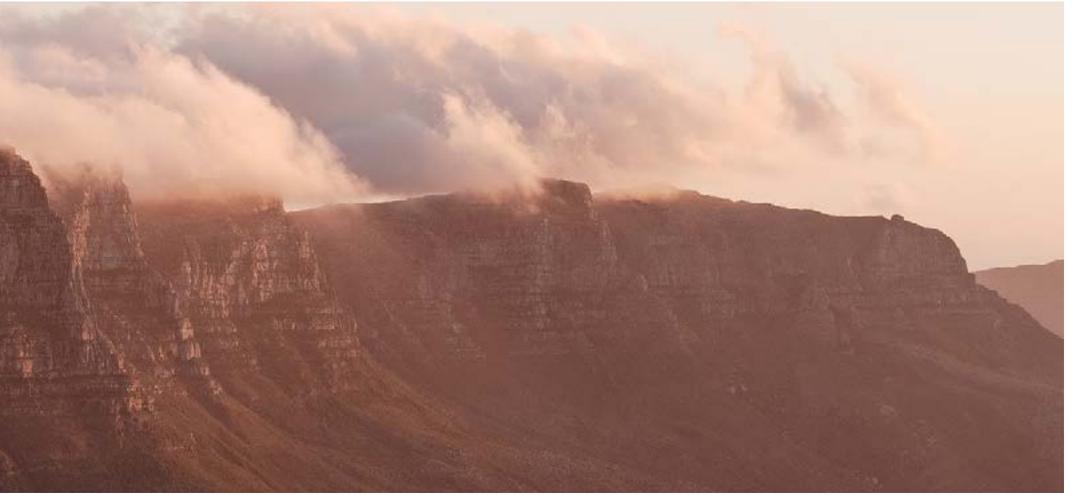
Need for continued improvements in regional coordination

Countries need to strengthen collaboration in strengthening policies for transboundary resource management.

Agenda 2063 of the African Union seeks a prosperous Africa of inclusive growth and sustainable development through various measures, such as mitigating the issue of rising risks of flooding and erosion resulting from climate change. The Abidjan Convention acknowledged the detrimental effects of coastal erosion on the socio-economic viability of the West African coast and vowed to support the implementation of the West African Coastal Adaptation (WACA) Program. The Nationally Determined Contributions of coastal countries emphasize the importance of coastal ecosystems for climate change adaptation while also recognizing their co-benefits in terms of climate change mitigation.

Programs that leverage regional collaboration to manage coastal zones are emerging. The West Africa Coastal Areas Resilience Investment Project for Climate Change Adaptation (WACA ResIP-CCA), implemented by the Governments of Mauritania, Togo, Cote, Sao Tome, and Principe, Senegal, and Benin. The project is being implemented through a portfolio of WACA Resilience Investment Projects which mainstream climate risks (i.e. sea level rise, flooding, temperature, extreme weather, etc.) and resilience measures into national policies and strategies.

Continued improvements to regional coordination through stronger policy and regulatory frameworks will be necessary to advance the implementation of coastal adaptation. Significant work remains to be done in adapting African coastal zones to climate change to protect lives and property, increase the output of the blue economy, and provide vast socio-



economic benefits. With the proliferation of financing institutions and donor programs, there are also expanding opportunities to finance climate-resilient African coastal zones.

Africa needs to continue working on strengthening policies on regional collaboration, not just on transboundary conservation and resource management (e.g., for mangroves), but also on trade, which is in most cases dependent on countries' coastal zones. Examples of regional fisheries bodies for managing fishery activities, and some include the Benguela Current Commission (BCC), The Fishery Committee for the Eastern Central Atlantic (CECAF), the Sub-Regional Commission on Fisheries (SRFC), the Ministerial Conference on Fisheries Cooperation among African States Bordering the Atlantic Ocean (COMHAFAT), the Regional Fisheries Committee for the Gulf of Guinea (COREP), Fishery Committee of the West Central

Gulf of Guinea (FCWC), International Commission for the Conservation of Atlantic Tunas (ICCAT) and South East Atlantic Fisheries Organization (SEAFO). Other structures in Africa include the Transfrontier Conservation Areas (TFCAs), which refer to areas that straddle the boundaries of two or more countries where the natural and cultural resources are collaboratively managed by the Governments and/or Authorities involved and may include one or more protected areas as well as multiple resource use areas.

Nature-based solutions recognized as important for coastal adaptation

The 21 countries that submitted updated NDCs by October 2021 mentioned the need to invest in nature-based solutions (NbS) for coastal and marine protection. However, there is close to a US\$5 billion annual investment gap in Africa in broader NbS-related financing.

NbS involves the use of mechanisms that prioritize the management, protection, and restoration of ecosystems for the benefit of responding to climate change risks. Examples of NbS include afforestation and reforestation using native species, e.g. planting native mangrove species along coastal zones to reduce coastal erosion, restoration of wetlands and watersheds, and enhancing the biodiversity of ecosystems. The groups of people who depend on these natural systems, therefore, work to ensure that the systems are healthy, functional, and have maximum biodiversity. This means that nature-based solutions should be able to provide benefits to people without compromising the quality of these ecosystems.

NbS for coastal areas across Africa are cost-effective due to the state of development of most coastal zones across the continent i.e., most zones are still rural, with those that are urbanized having the capacity to integrate NbS into their development plans. NbS can protect grey infrastructure in coastal zones, particularly for rapidly urbanizing areas that need hard infrastructure to meet the needs of the growing population and the increasing climate change risks.

Increasing investments into NbS in coastal zones requires governments and other development actors to prioritize NbS alongside other infrastructure solutions for coastal zones. This means that policies and investments must be aligned with the need for these solutions. Private sector investments should also integrate the need for NbS in coastal areas. For example, private sector investments in coastal infrastructure development can be accompanied by investments in mangrove restoration and protection, as these can provide long-term protection of this infrastructure.

However, the integration of NbS into adaptation in coastal zones should be informed by principles such as doing no harm, maintaining or strengthening ecosystem integrity, being based on policy integration and capacity building, while ensuring equitable governance and participation, as well as transparency and collaboration. The implementation of these solutions following NDC implementation should consider the needs of communities, and have the full participation of local stakeholders and communities, particularly women and young people. Nature-based solutions can also be implemented inland and away from coastal zones, particularly in landlocked countries. These solutions can aid in water resource management, management of land degradation, and biodiversity conservation.

A group of people are seen from behind, engaged in planting young saplings on a dark, sandy beach. The scene is set at sunset, with the sky transitioning from a deep orange to a soft purple. In the background, the calm ocean meets the horizon, and a few orange lifebuoys are visible. The overall atmosphere is one of active environmental stewardship.

Agenda for action Reflecting the urgency of adaptation at the national, regional, and international levels

A unified continental voice on the urgency of implementation is needed. African governments should reflect on the urgency of the implementation of adaptation in international communications and national policies and urge international financial institutions to give equal priority to the implementation of adaptation alongside planning.

Countries across the continent recognize the importance of transitioning from simply planning for adaptation to the actual implementation of these adaptation plans. In countries where there has been successful implementation, strong coordination structures have played a key role in ensuring the allocation of both domestic and international finance towards priority areas for implementation. Ensuring the 'development first' approach that is emphasized by African stakeholders will require that the adaptation process is seen through, where implementation of adaptation is given equal priority alongside planning.

Achieving equal priority for implementation will require: (a) Clear signals to the international community by national governments on the urgency of a transition to implementation through countries' communications e.g. to the UNFCCC, (b) Structuring international climate finance mechanisms to enable equal priority in allocation between planning and implementation of adaptation, and (c) Integration of Technology Needs and Capacities into existing national development plans and budgets so that they are seen as a critical means for improving climate resilience and community adaptation.

Need for more finance for implementing adaptation

Need to scale up mobilization of international climate finance to complement domestic finance.

Despite the pre-Covid 19 economic performance, the continent has limited capacity to respond to climate change risks. Although African countries are engaging in the mobilization of domestic climate finance for adaptation, international actors will still need to scale up adaptation finance. This means that developed countries need to meet their promise of mobilizing over US\$100 billion/year by 2020, and doubling adaptation finance, and prepare to make a new and more ambitious climate finance commitments that significantly exceed this target, to enable African countries to meet the costs of adaptation to current and future climate change. From 2019 to 2020, around 55% of adaptation finance commitments tracked in Africa were in the form of loans, with concessional debt (30%) and commercial debt (23%).

African countries need accurate estimates of their adaptation finance needs, which can then be used to set national and international aims for the mobilization of finance. The Nationally Determined Contributions (NDCs) of 51 African countries cumulatively show a need for an estimated US\$579 billion in investment for adaptation through 2030. National governments should develop national investment plans and strategies that break down program financing needs that align with the NDCs and this should be supported.

Grant-based adaptation finance will be important if Africa is to successfully implement the adaptation components of its NDCs. DFIs and multilateral climate finance institutions should commit to scaling up the proportion of grant-based adaptation finance allocated to African countries.



African countries will need grant-based adaptation finance, which is important for meeting their adaptation needs. Meeting the climate financial needs of all African countries will require current funding to be massively scaled. However, scaling up of this finance should not come at the expense of further increasing the debt burdens of African countries. In 2019, the debt burden of least developed countries reached US\$744 billion. The Covid-19 pandemic has pushed more countries further into debt, meaning that the continued financing of adaptation through debt-based terms and mechanisms will not improve the situation. Although concessional finance can be a useful tool when leveraged by development financial institutions seeking to finance sustainable development and climate action, while also unlocking private sector investments, grant-based finance should be prioritized for adaptation. This means it is important for more grant-based finance to be made available to institutions that are implementing adaptation actions at the local and national levels.

International development finance institutions (DFIs) should supplement these continuing efforts by committing to scaling up the proportion of finance allocated to these key sectors. DFIs should also commit to distributing this finance with balanced allocation amongst all sectors that are critical to adaptation in Africa, such as the agricultural, water, and coastal adaptation and health sectors. Concessional investments can also benefit African youth start-up investments in digital technologies for adaptation in relevant sectors.

Private sector financing is not a silver bullet for adaptation. African countries still need to understand the specific contexts where private sector financing will be more effective. Further work is needed to understand how and where private sector financing will be more effective, and where it could perpetuate inequalities and vulnerabilities.

The potential role of SMEs in accelerating adaptation to climate change.

Climate finance should be used to support the deployment of digital technologies to smaller firms that have difficulties in accessing finance from financial institutions.

Many SMEs are already adapting to climate change, e.g., through taking credit to protect their premises against climate change risks or changing business models to meet climate change-driven changes in demand. Small and Medium-Sized Enterprises (SMEs) have in the past led the adoption of digital technology across Africa that has accelerated access to communication and financial services within communities. For these SMEs, leveraging their innovation and technology development, deployment and use potential will require access to finance to cover the cost of investment in these technologies, which remains a critical barrier to the adoption of these technologies by SMEs. Financial institutions are usually reluctant to extend affordable credit, partly because they do not have sufficient information to assess the creditworthiness of these SMEs, but also because the SMEs do not have assets that could be used as collateral for the acquisition of credit.

SMEs need financing to cover the initial and operating costs of digital technology, particularly that which is still new. According to the International Finance Corporation, more than 65 million enterprises, 40% of which are in developing countries, have an unmet annual financial need of US\$5.2 trillion. In Africa, the financial needs of SMEs are estimated at US\$400 billion annually, but only 17% of this has been met through current financing mechanisms. Further, this financing gap is experienced along gender lines, with female-owned SMEs experiencing a larger financing gap.

Existing and future adaptation finance flows can be used to remove barriers for access to finance for investments in digital technologies by SMEs. Examples of interventions that can be funded using adaptation finance include: (i) credit enhancement mechanisms that provide guarantees on credit to SMEs, (ii) leveraging blended financing mechanisms to crowd in digital technology private sector investors with which to enhance competition and make digital technologies more affordable, and (iii) working with financial institutions to design SME-targeted lending instruments that are based on cash flows as opposed to collateral.



Strengthening regional integration and collaboration in support of adaptation

Regional cooperation in the development and deployment of technology for sectoral adaptation across Africa, e.g. in the advancement of digital transformation and in the advancement of trade and management of transboundary resources, will accelerate progress in the implementation of adaptation.

African countries rely on each other to address climate change, and this will increasingly be the case as climate change risks are exacerbated. Many countries in Africa have shared natural (e.g. rivers and lakes) and non-natural

resources (e.g. roads and trade-links) or economic interests that are essential for adaptation to climate change. For example, Kenya, which has previously faced food shortages triggered by climate change, has leveraged trade links with Tanzania and Uganda to import food commodities and address these shortages. Additionally, collaboration on the management and use of transboundary forests in West and Central Africa has contributed towards limiting and managing conflict and conserving these resources, which are increasingly threatened by climate change. Regional coordination avoids conflicts which wipe out development gains and

exacerbate vulnerability to climate change risks. Regional integration mechanisms can ensure that countries within regions have the correct mechanisms to enable collaboration not just on shared resources but also on common interests. This means that beyond the national efforts for responding to climate change, African countries still need to advance their regional integration.

Stronger regional integration in Africa contributes towards the creation of a common market for goods and services, increases the bargaining power of African countries, particularly in relation to exports of extractive goods to other countries outside the continent, enables pooling of resources for risk transfer, and management and resource management, provides a framework for coordination and contributes towards conflict prevention and resolution in most cases. Regional integration is also needed for the management of transboundary resources, including water resources. The Africa Agenda 2063 outlines those mechanisms and pathways through which regional integration can be strengthened. African countries should therefore use the Africa Agenda 2063 framework as a guide for sustainable development and climate

change adaptation plans and strategies. Countries should coordinate their design of national industrial strategies to take advantage of trade opportunities in the short and long term.

The advancement of regional integration for the implementation of adaptation will also require the allocation of financial and technical resources towards the implementation of regional coordination policies. The African Continental Free Trade Area (AfCFTA) agreement, if fully implemented by African countries, has the potential to boost the agricultural sector's contribution to adaptation in Africa through trade. This will require countries to develop infrastructure and invest in digital technology that increases connectivity, particularly for SMEs that are looking to access the regional markets. According to the United Nations Economic Commission for Africa, full implementation of the trade agreement will create demand and supply for advancing the transport infrastructure across the continent, which will improve trade, income, and ultimately the resilience of communities.

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