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New Data for Africa's Changing Climate:

Mapping Risks, Readiness and Policy Action

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Acknowledgments

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Executive summary

Overview

The African continent is highly vulnerable to climate-related risks. Average temperatures are steadily rising, reaching a record 1.3°C increase in 2024 compared to the 1981-2010 baseline period. Climate-related hazards such as extreme heat events, agricultural droughts and intense rainfall already disrupt livelihoods, infrastructure and food systems across the continent. These hazards will intensify unless global emissions are significantly reduced.

At the same time, Africa contributes only 4% of global energy-related greenhouse gas (GHG) emissions. Climate mitigation presents a strategic opportunity to leapfrog carbon-intensive development pathways, avoiding carbon lock-in and resulting in direct development gains such as cleaner air and improved public health. Policymakers need foundational data on key climate indicators to point the way toward a low-carbon, climate-resilient path. Yet these data remain limited for most African countries.

This report contributes toward addressing the gap in foundational data. First, it shows how African countries and cities are exposed to major climate-related hazards, such as extreme heat, while assessing adaptation readiness of countries. Second, it describes the climate mitigation policy landscape in African countries along with key policy trends. In so doing, it breaks new ground by building on novel datasets that use robust methodologies developed by the Organisation for Economic Co-operation and Development (OECD), Global Green Growth Institute (GGGI), the OECD Sahel and West Africa Club (SWAC) and the World Bank, covering 28 African countries that jointly account for around 73% of Africa's GHG emissions. It is important to note that a comprehensive cross-country adaptation policy comparison of the kind available for mitigation is not yet feasible given the absence of a harmonized global methodology for cataloging national adaptation policies. This remains an important limitation in the field, and an area this report flags as a priority of future work.

Findings

- **Vulnerability**: African countries are increasingly exposed to extreme weather events, including heat, droughts and intense rainfall. Heat stress already affects half of the countries analyzed, with Sahelian nations among the most vulnerable. Agricultural droughts threaten food production, while extreme precipitation disrupts transport and urban systems. Urban areas, where most future population growth is expected, are particularly vulnerable due to inadequate infrastructure and planning. These risks will intensify and occur more frequently without global mitigation efforts, underscoring the need for national adaptation strategies implementing investments in climate-resilient infrastructure and urban development.

- **Importance of adaptation**: adaptation extends far beyond infrastructure. It requires strong institutions, accessible climate data, effective governance and finance. African countries' ability to adapt varies widely, even among those with similar income levels. While economic development can enhance resilience, well-designed policy frameworks and institutional capacity are equally important. Most sub-Saharan African countries could significantly strengthen their institutional and legal frameworks to align with global practices, including by defining clear government approaches, targets and mechanisms for implementation and monitoring.

- **Progress toward mitigation**: climate mitigation action in the region increased steadily through the 2010s, particularly after the Paris Agreement, but it has slowed since 2021. Early progress in climate mitigation action was mostly driven by the adoption of new policies, followed by a strengthening of existing ones. Climate mitigation policy action efforts focused on the buildings, electricity and industry sectors. Some African countries are leading policy innovation: Ethiopia was the first country in the world to ban the import of passenger cars with internal combustion engines from 2024.

- **Policy mix**: Africa's policy mix is dominated by non-market-based instruments such as regulations and information instruments. After the Paris Agreement, Africa's institutional framework related to targets, governance and international cooperation also strengthened considerably. Market-based instruments such as carbon pricing and subsidies for renewables experienced only marginal progress and remain mostly absent from Africa's policy mix in 2024 except for fuel excise taxes.

- **Climate mitigation action by sector**: climate mitigation action differs significantly across sectors. Climate mitigation action in agriculture is the highest, consistent with its largest emissions share. However, climate mitigation action tends to be misaligned in transport and waste: both sectors contribute to a significant emissions share yet have the lowest levels of climate mitigation action.

- **Climate mitigation action by subregion**: African regions and countries have progressed at different speeds. East Africa showed the largest increase in climate mitigation action, followed by countries in Southern Africa, and North Africa and West Africa. There is considerable heterogeneity of climate mitigation action within regions with Kenya, Nigeria and South Africa emerging as regional leaders. Encouragingly, all African countries still have significant scope to strengthen climate mitigation action by adopting new or strengthening existing policies to avoid locking in carbon-intensive consumption and production patterns.

Recommendations

The evidence presented in this report makes a strong case for urgent, coordinated action. Decisions in the coming decade will determine whether Africa charts a climate-resilient, low-carbon development path or replicates the costly, carbon-intensive patterns of earlier industrializers. Four priorities stand out:

- **Close the data gap on adaptation policy and climate resilience interventions**. Effective policy requires a reliable picture of what interventions are in place, where momentum is building, what has worked and where critical gaps remain. While the Adaptation and Resilience Readiness Assessment offers a rigorous

diagnostic approach, it cannot support continent-wide benchmarking or trend analysis. Expanding this diagnostic, developing a formal adaptation policy taxonomy and strengthening subnational data collection are important and practical near-term steps.

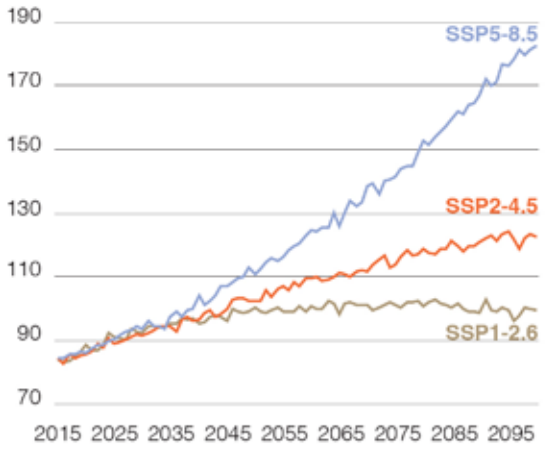
- **Pursue pragmatic, sequenced approaches to adaptation implementation**. Many African countries have made genuine progress in establishing adaptation strategies and institutional arrangements for building climate resilience. However, implementation is often undermined by limited administrative capacity, overstretched line ministries, weak links between national planning and local delivery, and chronic underfunding of agencies responsible for climate mitigation action. Countries should identify practical entry points, such as a particular sector, institution or geographic area with existing capacity, to generate more durable progress than pursuing reforms that outpace reality on the ground (Mealy, Ganslmeier and Hallegatte, 2025[1]).

- **Mobilize and deploy climate finance more effectively**. Many African countries face high borrowing costs, limited fiscal space and debt sustainability pressures that constrain their ability to invest in climate mitigation action. Simplifying access, improving the terms on which finance is offered and ensuring that a far greater share reaches the most vulnerable countries are responsibilities that fall primarily on the international community. For African governments, priorities include strengthening public financial management systems; climate budget tagging processes; and planning frameworks that determine whether finance, once accessed, is deployed effectively and transparently.

- **Use the urbanization window to avoid carbon lock-in**. Africa's rapid urbanization is simultaneously one of its greatest development opportunities and one of its most consequential climate decisions. African governments, regional bodies and city authorities have a rare opportunity to lock in climate resilience. Before growth patterns become entrenched, they can prioritize climate-conscious spatial planning, resilient infrastructure standards and nature-based approaches to urban water and heat management, while preserving the ecosystem services provided by surrounding landscapes through integrated landscape management. This offers a cost-effective path to avoid expensive retrofitting challenges that have constrained climate mitigation action in more developed urban systems.

A very high-emissions scenario could lead to a doubling of hot days by 2100

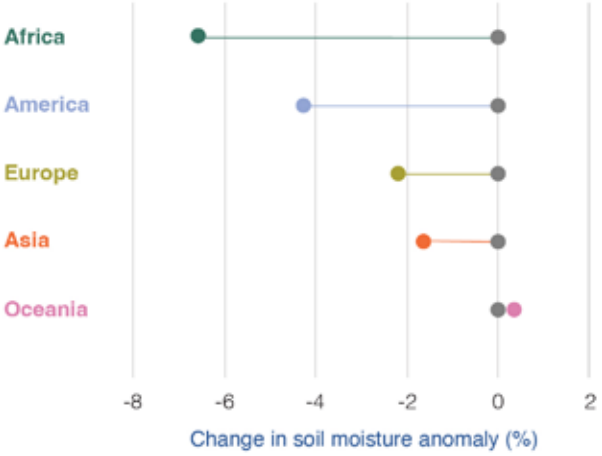
Mean number of hot days (days/year) on the African continent across emissions scenarios, 2015-2100



Under the very high-emissions scenarios, the number of hot days across Africa could double by 2100, a potential 112% increase relative to the climate reference period 1995-2014.

Africa already suffers the most severe droughts across all major continents

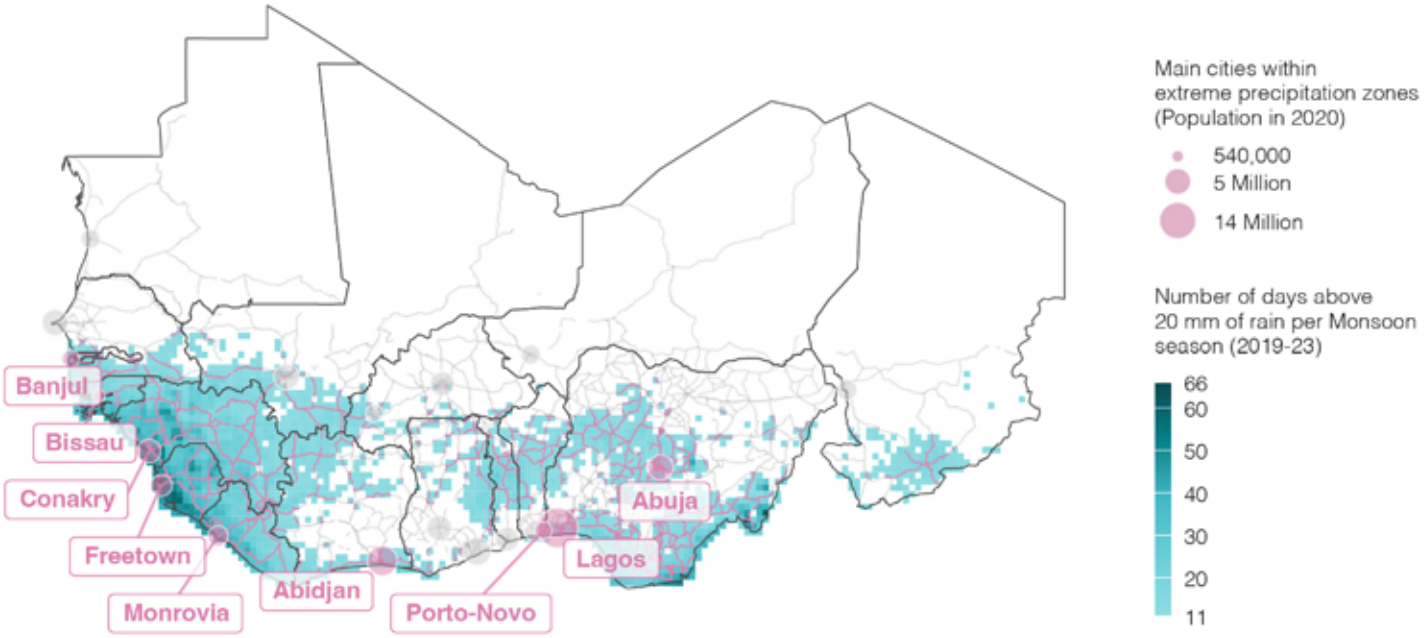
Soil moisture anomaly (%) change, 2024-2024 vs. 1981-2010



Africa already shows markable soil moisture declines on land between 1981 and 2024, including declines on croplands, indicating rising risks to agriculture. While emissions scenarios warn of a further worsening of droughts.

Extreme precipitation affects infrastructure and connectivity

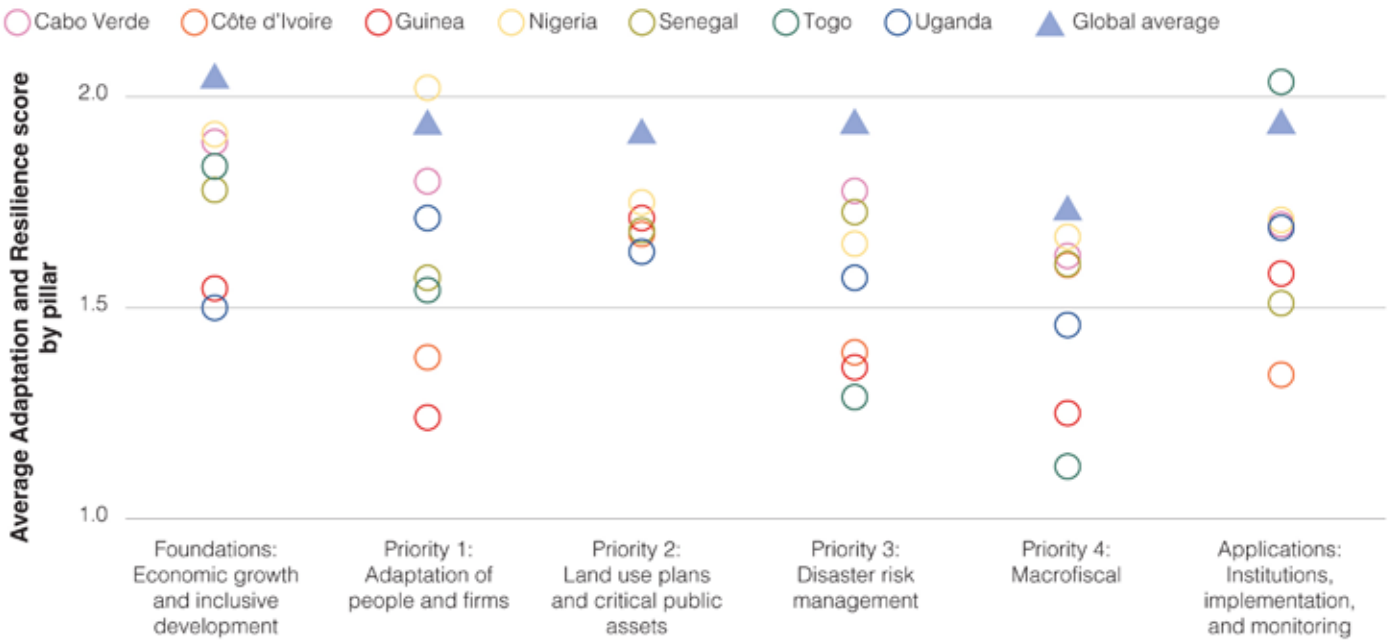
Main cities, main roads, and the number of very heavy rain days (precipitation over 20 mm) per Monsoon season (2019-2023) in West Africa



In West Africa, 42% of main roads (39 773 km of 95 573 km) and nine major cities—home to 36.6 million people—lie in extreme precipitation zones. Prioritising investments in roads along critical development corridors could boost regional connectivity and economic growth.

Sub Saharan African countries have made important progress in strengthening resilience, but significant challenges remain

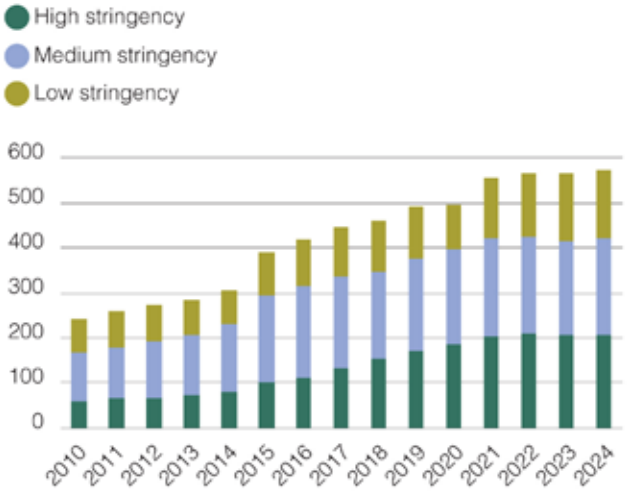
Average Adaptation and Resilience score by pillar for Sub-Saharan African countries and the global average



While most sub-Saharan African countries included in this analysis lag behind the global average, there are promising signs of leadership and innovation in countries like Nigeria and Togo.

Climate action in Africa has increased, but has lost momentum since 2021

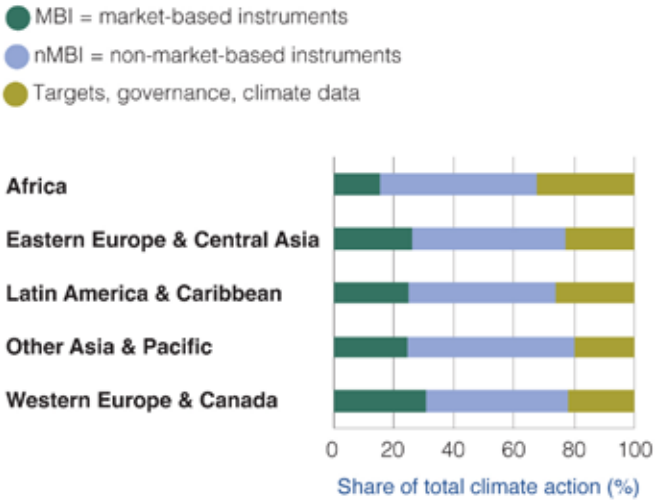
Total number of adopted policies by stringency, 2010-2024



Climate action (measured as a combination of adopted policies and their stringency) has more than doubled between 2010 and 2024. The strong acceleration after the Paris Agreement in 2015 was followed by a marked slow down from 2021.

Market-based instruments are underrepresented in Africa

Share of climate action in % by policy instrument type: world regions, 2024



Across world regions, Africa puts least emphasis on market-based instruments such as carbon pricing or environmentally beneficial subsidies. Non-market-based instruments dominate the mix (e.g., regulations and information instruments).

1

Introduction

Africa is on the frontline of climate change. The continent is projected to experience some of the most severe and prolonged impacts of global warming, including more extreme heat, intense rainfall, droughts and flooding.

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Yet Africa accounts for just 4% of global energy-related greenhouse gas (GHG) emissions, a share not expected to increase significantly in the coming decades (IEA, 2022[2]). The scale and intensity of these impacts until the end of the century will largely depend on the pace at which global emissions are reduced, underscoring the importance of ambitious climate mitigation and adaptation strategies worldwide. For Africa, adaptation will be essential to protect lives, sustain livelihoods and secure the development gains of recent decades.

As recognized in the Paris Agreement a decade ago, cities, regions and local governments are at the forefront of climate mitigation action. Africa is urbanizing rapidly. The urban population is projected to grow by over 700 million between 2020 and 2050, reaching 1.4 billion with two-thirds of the African population living in urban areas by then (OECD et al., 2025[3]). Urban centers offer opportunities for economic development, connectivity and service delivery.

Urban centers are increasingly exposed to climate-related hazards. Projections for Africa show a clear upward trend in the number of hot days per year, reflected in the sharp rise in the population exposed to such conditions. By 2050, thousands of small, medium and large cities across West Africa alone are projected to face more than 180 hot days each year, meaning that well over half of all days will exceed heat-stress thresholds. The number of urban residents living under this same level of extreme heat would increase by 137 million people from 2020 to 2050. This expanding exposure signals a profound shift in baseline living conditions, with prolonged heat likely to intensify pressures on labor productivity, public health and energy demand across the region.

This report aims to strengthen the evidence base for climate action in Africa by bringing together novel datasets on climate impacts, adaptation readiness and mitigation policy for the countries where comparable data are available. Its objective is to help policymakers, researchers and development partners identify trends, benchmark progress and pinpoint gaps across the continent's response to climate change.

To deliver this, the report draws on robust methodologies developed by the OECD, the OECD Sahel and West Africa Club (SWAC) and the World Bank, structured around two domains:

- **Climate impacts and adaptation readiness**, showing how African countries and urban settlements are exposed to major climate-related hazards, including extreme heat, droughts and intense rainfall, while also exploring countries' adaptation readiness

- **Climate policy development**, describing the climate mitigation policy landscape in African countries along with key policy trends across sectors and policy instrument types, while identifying key policy gaps

Throughout the report, references to continent-wide patterns are based on a consistent sample of African countries for which comparable data are available, providing coverage of the large majority of Africa's GHG emissions while acknowledging remaining data gaps.

The report uses the Climate Actions and Policies Measurement Framework (CAPMF) to identify climate mitigation policies. The CAPMF was developed under the OECD International Program for Action on Climate. It is a climate policy database that captures key policies (e.g. carbon pricing, regulations, information instruments) across many countries and for the period 1990-2024 in a consistent and harmonized way (Nachtigall et al., 2022[4]). It covers 28 African countries that jointly account for around 73% of African GHG emissions. Country selection for the entire report was based on availability of climate policy data, which were collected in a joint effort by the OECD, OECD SWAC, the World Bank and the Global Green Growth Institute (GGGI). By contrast, comparable, cross-country data on adaptation policies

and implementation remain far more limited, constraining continent-wide analysis of adaptation readiness.

Historical and forward-looking indicators on exposure of people, assets and ecosystems to climate-related risks are based on Earth observation (EO) and other geospatial data using scientifically robust methods. Climate projections show the greatest risks at national and regional levels. The forward-looking indicators span the period 2015 to the end of the century and include midpoint anomaly values in the 2030s, 2050s, 2070s and 2090s. Meanwhile, historical indicators use observed data and cover the 1979-2024 period depending on data availability (Maes et al., 2022[5]; Maes et al., 2025[6]).

By linking hazard exposure with urban growth and policy action, the report identifies hotspots where risks are high and adaptation measures are urgently needed. These hotspots include transport corridors, rapidly expanding cities and key agricultural areas. This integrated perspective highlights where investments in climate-resilient infrastructure, adaptive social protection, stronger enforcement of standards and targeted interventions can protect communities, support economic activity and promote sustainable, low-carbon development in the most effective manner.

Consistent with these patterns, climate-related hazards are already generating substantial economic losses and social disruption in Africa. Recent events highlight the vulnerability of many African countries. For instance, Mozambique experienced more than USD 3.7 billion in damages from consecutive cyclones in 2019; Ethiopia and South Africa suffered significant drought losses in 2015; and Nigeria faced more than USD 6.1 billion in flood-related damages in 2022 (Hirvonen, Sohnesen and Bundervoet, 2020[7]; Charrua et al., 2021[8]; Abu and Ibebuchi, 2025[9]). These events are compounded by uneven exposure, with low-income countries often facing prolonged periods of extreme heat and limited adaptive capacity. Droughts threaten croplands and food exports, while extreme precipitation and heavy rainfall increasingly disrupt transport infrastructure and urban mobility. These dynamics highlight the urgent need for climate-resilient infrastructure and stronger regional connectivity.

While Africa's GHG emissions are low, climate mitigation action presents a strategic opportunity to leapfrog carbon-intensive development pathways, and in doing so, advance African countries' own development agendas. Beyond meeting global emissions targets, well-designed climate mitigation action can build competitive, modern economies with clean energy, more productive industries and better jobs. Moreover, with the right support, particularly in technology transfer, African countries can avoid the carbon lock-in experienced elsewhere. Some African countries are at the forefront of developing innovative policies. For example, Uganda has committed to electrifying its buses and motorcycles by 2040. For its part, Ethiopia became the first country in the world to ban the import of passenger cars with internal combustion engines in 2024. Such decisive measures not only reduce emissions but also deliver important development gains, such as improved air quality, better health outcomes and greater economic resilience.

In this context, African countries have both an urgent imperative and a unique opportunity. Integrating climate adaptation into (sub)-national planning, infrastructure development and policy portfolios can protect vulnerable populations and sustain economic growth. At the same time, strategically designed mitigation policies can actively support development, driving investment, creating jobs in clean energy and resilient infrastructure, and positioning African economies to compete in a rapidly decarbonizing economy. These two agendas, pursued together, offer Africa viable pathways to inclusive, long-term prosperity.

Over the past decade, African countries have expanded significantly their

climate mitigation action by adopting new policies or strengthening existing ones, but progress has slowed in recent years. Climate mitigation action had particularly strong increases in the electricity and buildings sector. Non-market-based instruments, such as standards and mandates, dominate the climate policy landscape while market-based tools like carbon taxes or emissions trading systems remain rare. Encouragingly, all 28 African countries still have significant scope to strengthen climate mitigation action by adopting new or strengthening existing policies to avoid locking in carbon-intensive consumption and production patterns.

2

As climate risks rise, Africa's adaptation readiness is emerging

As sub-Saharan Africa is one of the most climate-vulnerable regions in the world, building climate resilience is critical to safeguard hard-won development gains and harness opportunities from transformative trends like urbanization.

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With more than half of Africa's urban areas still unbuilt, governments have an exceptional opportunity to build resilience in cities from the ground up. In this context, this chapter analyzes the economic costs of climate-related disasters over the past three decades. It then assesses the impacts of extreme heat, extreme precipitation and drought – both historical and projected. Where feasible, it explores the potential implications of these hazards on agriculture, regional development and urban systems. While the primary analysis is conducted at the national level, the chapter integrates spatially explicit evidence and, where possible, zooms in on major urban agglomerations to highlight the implications of climate hazards for Africa's rapidly growing cities. Finally, drawing on World Bank tools like the Adaptation and Resilience Readiness Assessment and the *Adaptation Principles*, the chapter assesses the state of adaptation and resilience across African countries, **mapping where progress is under way and where targeted action can build on it**.

Africa's development prospects are increasingly shaped by climate change. Floods, droughts, storms and heatwaves are already eroding hard-won development gains and intensifying pressures on communities, economies and governments. In sub-Saharan Africa (Hill et al., 2025[10]), which is recognized as one of the most climate-vulnerable regions globally, the stakes are critically high: risks are unevenly distributed and amplified by limited adaptive capacity (Nilsson et al., 2021[11]; Trisos et al., 2022[12]).

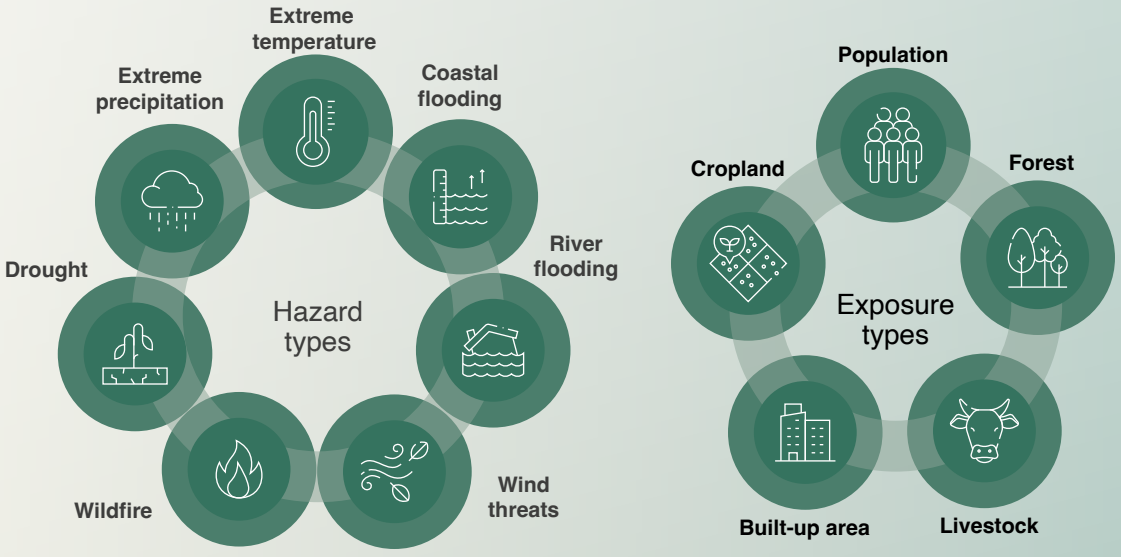
Climate resilience is a development imperative. It is needed not only to prevent the erosion of today's development gains, but also to reap the benefits from ongoing transformations sweeping across the continent such as urbanization. Urban areas offer improved access to services, infrastructure and economic opportunities compared to their rural counterparts (OECD et al., 2025[3]).

Urbanization can be a transformative opportunity for Africa since an estimated 61% of its total urban area in 2050 has not yet been built (OECD et al., 2025[3]). Consequently, most of tomorrow's cities are still in their formative stage, giving governments an unprecedented chance to shape urban growth before it becomes locked in. Indeed, by 2050, two out of three Africans will live in a city (OECD et al., 2025[3]). Rapid urbanization shapes both exposure and adaptive capacity. Growing cities concentrate people, assets and infrastructure in areas where climate hazards are intensifying, yet they also offer opportunities for more efficient, climate-responsive planning and investment. Understanding climate risks in sub-Saharan Africa therefore requires assessing hazards at the national scale while recognizing the pivotal role of urban systems in mediating impacts and shaping future resilience. Harnessing the dynamism of urban agglomerations can serve as a powerful engine for development and these cities must be able to cope with climate-related hazards – from extreme heat to intense rainfall.

This chapter starts by analyzing the economic costs of climate-related disasters over the past three decades, and then assesses the impacts of extreme heat, extreme precipitation and drought – both historical and projected. It combines EO and other geospatial datasets, and advanced climate modeling, to deliver a more detailed, spatially explicit picture of current and future climate hazards (Box 1). Bringing EO data and modeling inputs together strengthens the assessment of where hazards are intensifying, who is most exposed, and how infrastructure and economies may be affected. While the core analytical frame is at the national level, the chapter also provides selective zoom-ins on urban systems in West Africa. In so doing, it provides governments with a stronger evidence base for climate-resilient planning and investment. Where feasible, it also explores the potential implications of these hazards on agriculture, regional development and urban systems. The analysis underscores the need for proactive emergency preparedness and climate adaptation, as these events are expected to intensify in both frequency and severity. The second part of the chapter assesses the state of adaptation and resilience across African countries, revealing considerable scope for improvement.

Box 1. OECD / IEA methodologies for monitoring past and future exposure to climate-related hazards

In 2022, the OECD and International Energy Agency jointly developed a set of indicators to monitor how people and assets – such as population, croplands, built-up areas and forests – are exposed to a range of climate-related hazards. It focused on seven hazard types: extreme temperature, extreme precipitation, drought, wildfire, wind threats, river flooding and coastal flooding (Maes et al., 2022[5]). By using EO and other geospatial data sources, historical indicators were developed and updated on a yearly basis. These revealed where exposures have already been affecting communities and ecosystems. Due to the high spatio-temporal resolution and coverage, these indicators are available at both national and subnational levels, covering 1979-2024 depending on data availability.



Building on that foundation, follow-up OECD work developed forward-looking indicators to monitor future exposure of people and assets to three major climate-related hazards (extreme temperature, extreme precipitation and drought) (Maes et al., 2025[6]). The new methodology builds on projected data from the World Bank Climate Change Knowledge Portal and relies on multi-model ensembles based on 30 different climate models, covering a range of climate scenarios. These climate scenarios represent predefined storylines of socio-economic development associated with different levels of climate policy action and range from very low to very high emissions scenarios – the Shared Socioeconomic Pathways (SSPs). SSP-based scenarios ensure alignment with global assessments and comparability across regions. By using multi-model ensembles, the indicators provide reliable climate projections, while capturing the uncertainty of individual climate models. By calculating anomalies for different midpoints – the 2030s, 2050s, 2070s and 2090s – up until 2100, the indicators offer evidence to better support understanding and mitigation of the future impact of climate-related hazards.

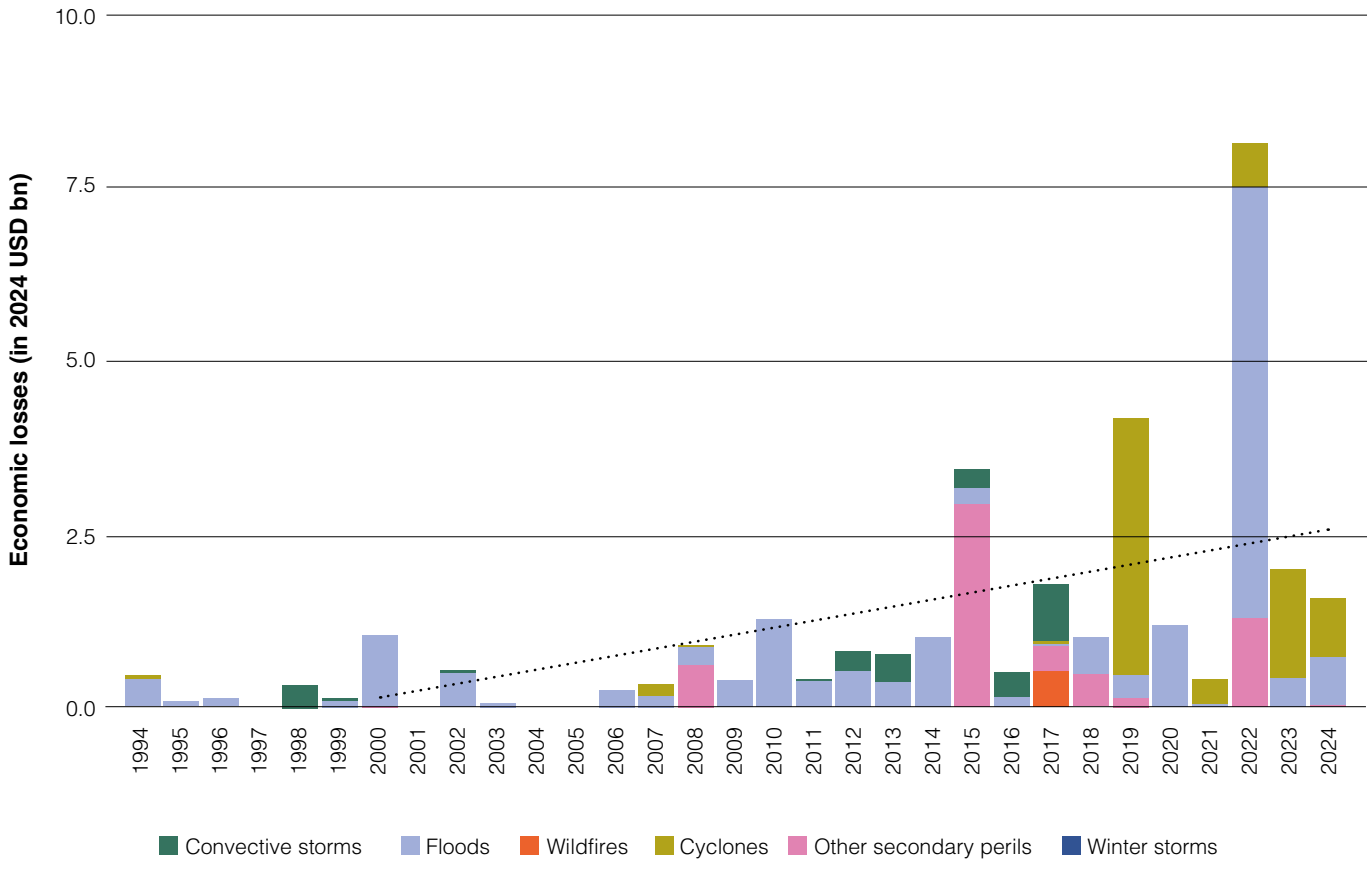
The regional analysis of climate hazards in West Africa uses simulations from the Coordinate Regional Climate Downscaling Experiment (CORDEX) – Africa under Representative Concentration Pathways (RCP) 4.5 and 8.5 to capture finer spatial detail and regional climate dynamics, providing more reliable projections for localized hazard assessment (OECD/SWAC, forthcoming). CORDEX is a global project that creates detailed regional climate projections by refining the coarse output of global climate models (Giorgi, Jones and Asrar, 2009[13]). The analysis draws on the CORDEX-Africa regional climate model ensemble (Nikulin et al., 2012[14]; Giorgi et al., 2022[15]). This dual approach combines global consistency with regional accuracy for robust policy and planning insights.

2.1 Climate hazard and disaster data reveal worsening economic and society risks

Climate-related disasters can cause significant economic damages and loss of life. Sudden extreme weather events across the African continent, such as cyclones, droughts and flash floods (Figure 1), can wreak havoc, especially when cities, countries and regions are unprepared. For its part, Mozambique was hit by two consecutive cyclones in 2019. This led to cumulative economic losses of more than USD 3.7 billion (bn) – equivalent to 16.5% of its gross domestic product (GDP). Cyclones killed approximately 1 303 people and affected more than 3 million people – a tenth of its population (Charrua et al., 2021[8]). Nigeria and South Africa were hit by devastating floods in 2022, with economic losses of more than USD 6.1 bn. In Nigeria, up to 3.2 million people were displaced, leading to loss of life, property damage, and destruction of settlements and croplands (Abu and Ibebuchi, 2025[9]).

Figure 1 Economic losses from climate-related disasters have risen steadily over three decades

Cumulative economic losses (USD billion, 2024 prices) across selected African countries, 1994-2024.



Note: The category "Other secondary perils" includes droughts and landslides. The category "Earthquakes" is excluded from this figure since earthquakes are not considered a natural disaster influenced by the climate. The selected African countries are Angola, Benin, Botswana, Burkina Faso, Cameroon, Cabo Verde, Côte d'Ivoire, Egypt, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda and Zambia.

Source: OECD calculations based on data provided by Swiss Re (sigma database). All rights reserved (Swiss Re Institute, 2025[16]).

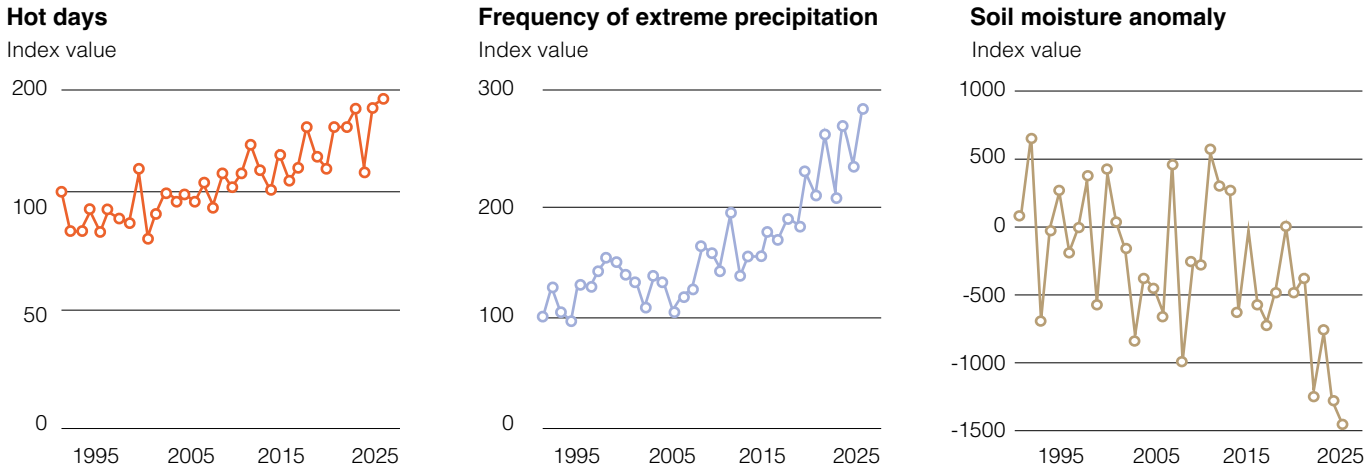
Swiss Re data show the cumulative cost of climate-related disasters such as storms, floods and wildfires is growing. Between 1994 and 2024, the selected African countries[1] experienced an upward trend in cumulative economic losses. This reflects a broader global pattern in which the costs of extreme weather events gradually rise each year, making it increasingly expensive to address their impacts (Figure 1). In fact, the average cumulative economic cost increased nearly 15-fold in 2020-2024 – from USD 0.18 bn in 1994-1998 to USD 2.7 bn (Swiss Re Institute, 2025[16]).

Despite these rising risks, there have been some positive developments over the past decades. For example, hospital disaster preparedness in sub-Saharan Africa has improved and disaster management capabilities have strengthened across 12 West African countries (Morton Hamer et al., 2017[17]; Farah, Pavlova and Groot, 2023[18]). These advancements demonstrate that disaster preparedness is becoming a cornerstone of effective humanitarian and development work. However, progress remains uneven and insufficient relative to the increasing frequency and intensity of climate-related hazards.

Across the African continent, there is a clear increase in extreme temperatures, extreme precipitation and drought. Extreme temperature shows a consistent upward trend, with the frequency of hot days (defined here as a day where daily maximum temperature exceeds 35°C) nearly doubling since the 1990s (Figure 2). Extreme precipitation also intensified markedly, rising by more than 150% over the last decades, indicating more frequent and severe precipitation events (Figure 2). Meanwhile, agricultural drought occurrences are increasingly common. Cropland soil moisture anomaly is exhibiting a persistent downward trend, with values well below the 1990 baseline, pointing toward rapidly drying conditions in the topsoil layer of croplands (Figure 2). These trends provide a broad regional snapshot, with the next sections exploring country-level patterns for each hazard in more depth.

Figure 2 Broad regional overview of key climate hazard trends indicate worsening conditions

Indexed population-weighted number of hot days, frequency of extreme precipitation and soil moisture anomaly, averaged across selected African countries, 1990-2024.



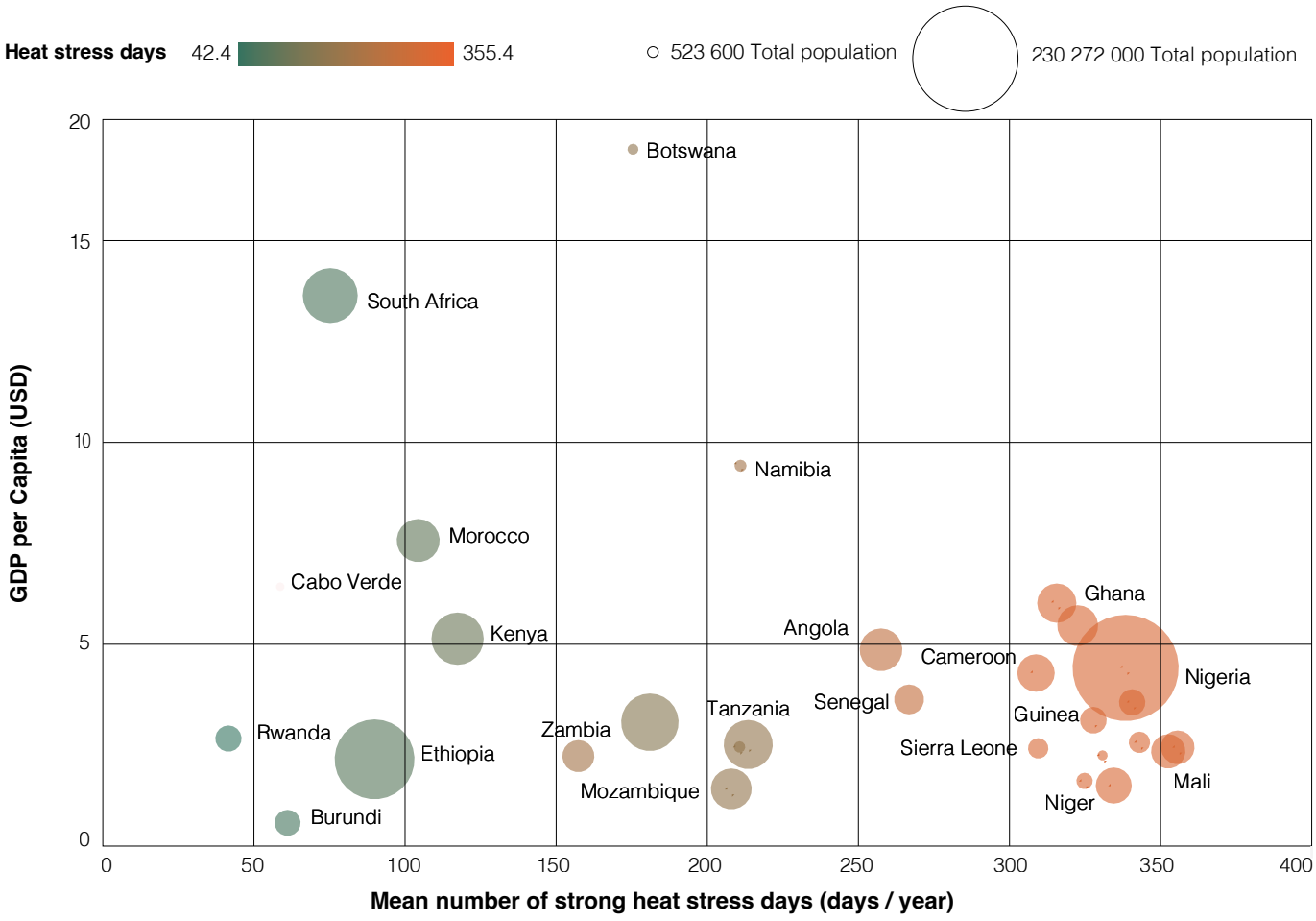
Note: All three indicators are shown as indices, with the value in 1990 set equal to 100. Each subsequent year represents the relative change compared to 1990. For example, a value of 150 means a 50% increase relative to 1990. Countries selected are listed in Endnotes.
Source: OECD (2025), "Climate-related hazards: Historical exposure to extreme temperature", *OECD Environment Statistics* (dataset); OECD (2025), "Climate-related hazards: Historical exposure to extreme precipitation", *OECD Environment Statistics* (dataset); OECD (2025), "Climate-related hazards: Historical exposure to drought", *OECD Environment Statistics* (dataset).

Past and future challenges as population exposure to extreme heat is increasing

Most selected African countries across the continent experienced strong heat stress for more than half the year, with nearly half of the countries facing more than 300 days of strong heat stress annually (2020-2024 average) (Figure 3). Strong heat-stress days are computed using the Universal Thermal Climate Index (UTCI) to calculate the population-weighted mean number of days where feels-like temperatures exceed 32°C. The UTCI is a way of measuring how heat feels to people by not only considering temperature, but also humidity, wind speeds and solar radiation. A population-weighted measure reflects the average value where people live in each country. A day that feels "hot" in a big city affects more people than a hot day in a remote village. In the absence of reliable spatial population census data across the continent, this analysis uses the Global Human Settlement Layer, as it offers comparability across countries and regions.

Figure 3 Countries are unevenly exposed to heat stress with limited resources to adapt

Population-weighted mean number of strong heat-stress days (days yr^{-1}, 2020-2024 average) and GDP per capita (USD, 2024) across selected African countries. Bubble size reflects a country's total population.



Note: GDP per capita is purchasing power parity converted, based on 2020 as the reference year. The total population bubble size ranges from 523 600 for Cabo Verde to 230 272 000 for Nigeria, 2024. Heat stress exposure is assessed using the Copernicus Universal Thermal Climate Index (UTCI), which considers temperature, humidity, wind speed and solar radiation. Selected countries are listed in Endnotes.[3]
Source: OECD (2025), "Climate-related hazards: Historical exposure to extreme temperature", *OECD Environment Statistics* (dataset).

The combination of high exposure to extreme heat and limited national budgets presents significant adaptation challenges across the African continent, calling for targeted actions to build resilience and adapt. West African countries, as they are located near and in the Sahel, have always experienced heat, but these periods of heat stress are becoming more extreme and occurring over longer periods. Benin, Burkina Faso, Mali and Togo experience some of the highest levels of heat stress – approaching or reaching nearly year-round exposure to extreme heat. Notably, these same countries are among those with the lowest GDP per capita, suggesting limited resources and institutional capacity to adapt to, or mitigate the impacts of, heat stress (which include losses of labor productivity, crops and livestock, in addition to heat-related illness and mortality). The population of Nigeria, the largest in Africa, is exposed to close to 350 days of heat stress per year. Such conditions lead to more frequent heat-related illnesses and significant losses in labor productivity, particularly in outdoor sectors like farming and construction (Saeed et al., 2022[19]; Nasara et al., 2025[20]). In contrast, countries in the Great Lakes region (such as Rwanda, Burundi and Ethiopia) tend to experience relatively lower levels of heat stress (under 100 days), although Uganda is an exception with 200+ days.

Almost all selected African countries are projected to experience a further increase in extreme heat by the end of the century, with notable differences in future impact depending on global emissions trajectories. It is methodologically challenging to have population-weighted strong heat-stress days from now until the end of the century, given the detailed nature of this metric (which includes humidity, wind speeds and solar radiation). However, climate scenarios can project the number of days exceeding certain temperature thresholds (Figure 4). The difference between the very low and very high emissions scenarios is striking. Half of the countries are projected to experience an additional 73 hot days or more between the very low and very high emissions scenarios (Figure 4).

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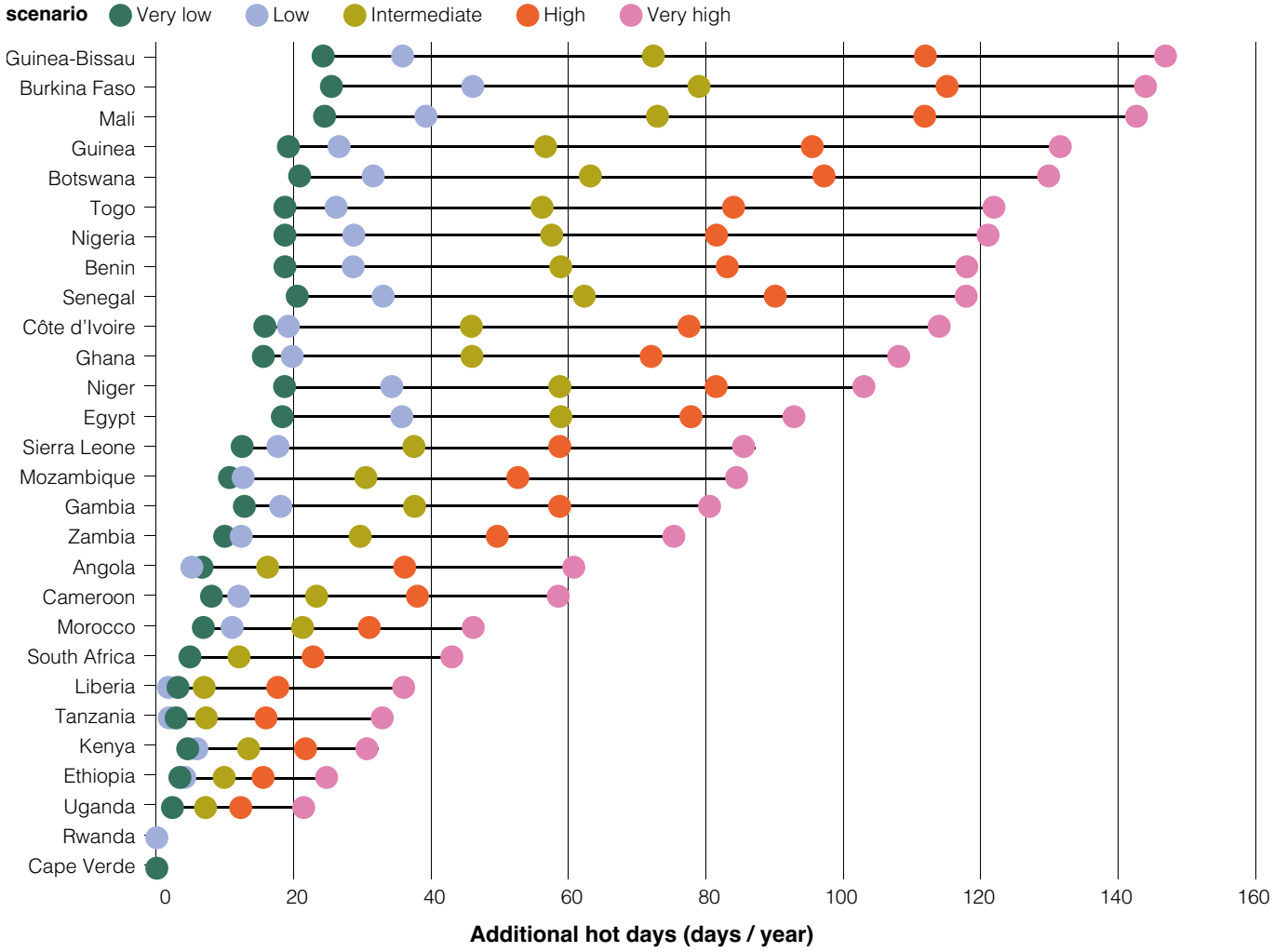
Figure 4 Extreme heat exposure will continue to worsen throughout the century without global climate mitigation efforts

Additional number of hot days (days/year) from very low to very high emissions scenarios for selected African countries, 2060-2099 compared to the climate reference period 1995-2014.



Note: Hot days are defined here as any day in the year where daily maximum temperature exceeds 35°C. Countries are listed in Endnotes.[3]
Source: OECD (2025), "Climate-related hazards: Projected exposure to extreme temperature", *OECD Environment Statistics* (dataset). Underlying projected data based on CMIP6 multi-model ensembles come from the World Bank (Climate Change Knowledge Portal, 2024[21]).

The disparity between the very low and very high emissions scenarios underscores once more the importance of global mitigation efforts globally to reduce future extreme heat exposure. The indicator in Figure 5 offers comparability across countries with regards to a country's additional extreme heat exposure until the end of the century. However, such national estimates may hide subnational disparities. Substantial geographic variation within countries should be expected, highlighting the need for analyses on localized disparities (Box 2).

Box 2. Geographic disparities of heat exposure: Insights from Niger

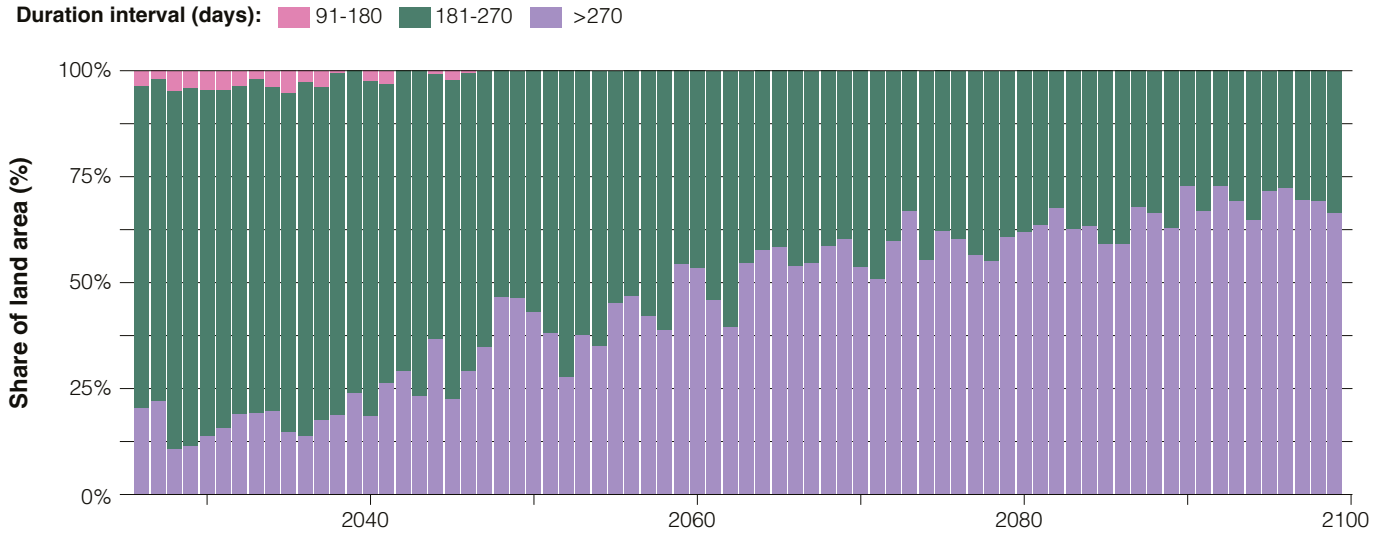
Summarizing hot days into a single national estimate facilitates cross-country comparisons and the identification of overarching trends. However, significant subnational variation in the frequency and intensity of hot days persists – both under current conditions and across projected climate scenarios. This spatial heterogeneity carries critical implications for policy and planning. A more granular, location-specific understanding of such patterns can support the design of targeted, context-sensitive adaptation strategies, particularly in settings where financial and institutional resources are limited.

In countries such as Niger, spatial disparities remain pronounced. While some areas experience near-continuous hot days, others are comparatively less affected. This underscores the need for differentiated policy responses.

The very high emissions scenario (RCP 8.5) shares the same radiative forcing target as SSP5-8.5, but it lacks the socio-economic dimensions incorporated in the Shared Socioeconomic Pathways. Under RCP 8.5, the spatial extent and intensity of extreme heat exposure increase markedly. By the end of the century (2080-2099), nearly 60% of Niger's land area is projected to experience extreme heat for more than 270 days per year, which approaches year-round exposure. The other parts of the country will continue to experience extreme heat around half or a third of the year. If future global emissions follow such a trajectory, adaptation interventions may need to be targeted toward regions expected to experience prolonged periods of hot days, particularly where large populations are at risk.

Figure 5 An increasing proportion of Niger's surface area is exposed to extreme heat by 2100

Share of land area exposed to hot days (Tmax > 35°C) across different duration thresholds for the very high emissions scenario (RCP 8.5), 2025-2100.



Note: Each bar represents the total land area of the country for a given year.
Source: OECD/SWAC (forthcoming), *Atlas of Urban Futures and Climate Hazards in West Africa.*

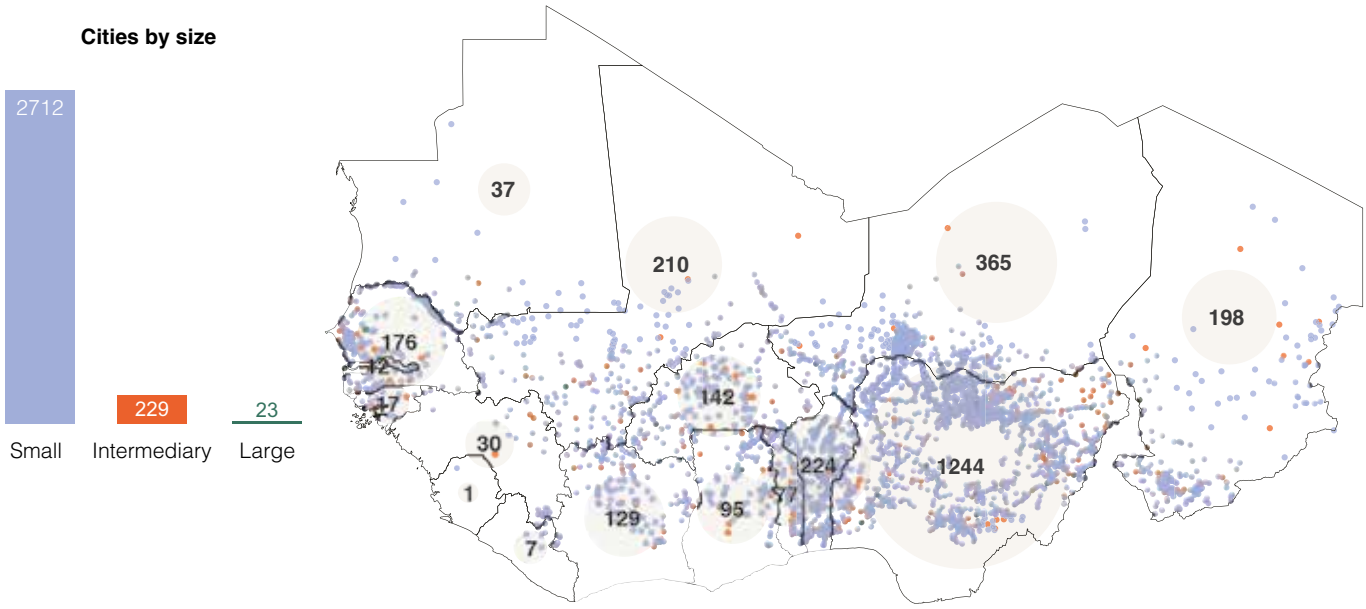
Urbanization's potential to drive regional economic growth faces heat-related risks: Example of West Africa

By 2050, urban areas across West Africa are projected to face substantial and intensifying exposure to extreme heat under the very high emissions scenario (see Box 2 for information on the geographic disparities of heat). By mid century, approximately 2 712 small cities (10 000 – 100 000 inhabitants), 229 intermediary cities (100 000 – 1 million) and 23 large cities (over 1 million) are projected to experience more than 180 hot days annually, equivalent to over half the year (Figure 6). Africapolis[2] projections of future urban agglomerations, defined as contiguous built-up areas with populations of 10 000 or more and inter-building distances under 200 meters, indicate this exposure will intensify significantly.

Strategic investments in urban resilience will be essential to mitigate the adverse impacts of extreme heat and to ensure that cities can fulfill their potential as drivers of regional development. In the absence of such measures, productivity losses – coupled with negative health outcomes – could significantly undermine urban economic performance and social well-being. A notable concentration of these urban centers is in Nigeria, which accounts for 1 244 cities (65% of its urban areas by 2050). As one of the region's largest economies and a key node in West Africa's development corridors, Nigeria's urban system plays a pivotal role in facilitating regional connectivity and economic integration. This status will be at significant risk if no steps toward resilience are taken.

Figure 6 By 2050, many cities in West Africa are projected to be exposed to hot days for over half the year

Projected distribution of small (light blue), intermediary (yellow) and large (dark green) urban agglomerations exposed to over 180 hot days under the very high emissions scenario (RCP 8.5), 2049-2053.



Note: Hot days are defined here as any day in the year where daily maximum temperature exceeds 35°C.
Source: OECD/SWAC (forthcoming), *Atlas of Urban Futures and Climate Hazards in West Africa.*

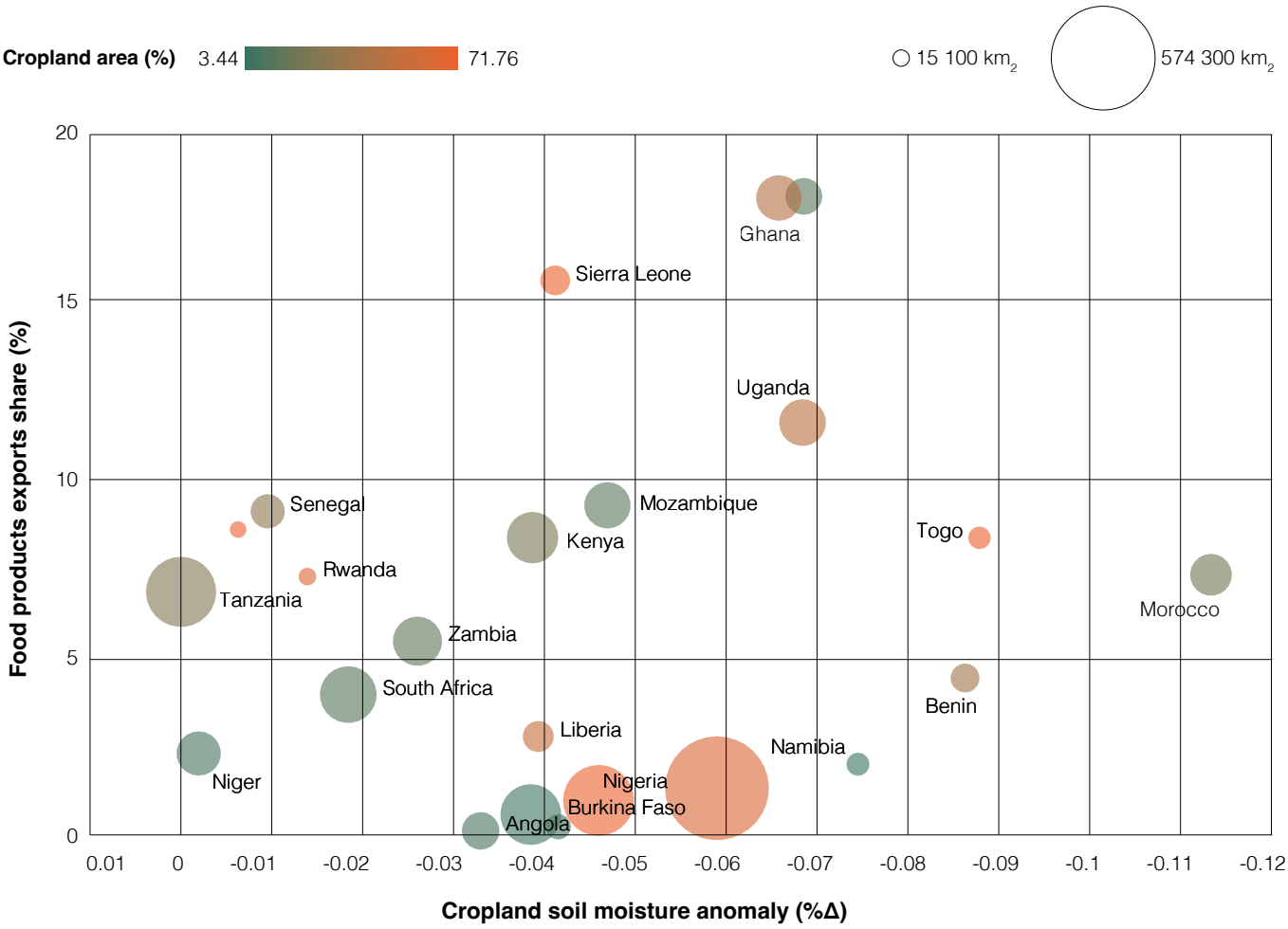
Agricultural droughts threaten food production

Extreme drought events have affected various regions of the African continent over the past years, especially in the Horn of Africa, which includes Djibouti, Eritrea, Ethiopia and Somalia. The Horn of Africa has become one of the most food-insecure regions of the world. Extreme drought has significantly affected crop production and food security, leaving people at risk of famine (Qu, Hao and Qu, 2019[22]). In 2015, there were an estimated 21.6 million food-insecure people in the Horn and East Africa; climate change is likely to worsen food security (Sandstrom and Juhola, 2017[23]). In 2022, an estimated 43 000 people died in Somalia alone due to drought, half of whom were children under the age of five (OCHA, 2023[24]). Drought conditions have been shown to deteriorate cropland, with monthly precipitation decreasing during key growing seasons (Qu, Hao and Qu, 2019[22]).

Most African countries covered in this report have experienced drier-than-average conditions in recent years compared to the climate reference period. Morocco shows the most severe soil moisture anomaly across all selected African countries (Figure 7). At the same time, several economies remain highly exposed to agricultural shocks. Cameroon, Ghana and Sierra Leone stand out with the highest share of food product exports (15-20%); any loss of crops in these countries will therefore have a global impact. Sierra Leone, along with Rwanda and Burkina Faso, are some of the countries with the largest share of cropland cover (60-70%) (Tesnière, Maes and Haščič, 2024[25]). This suggests that a significant proportion of cropland area may be vulnerable to these drier-than-average conditions. Across the African continent, the increasingly dry conditions and high agricultural exposure (whether in cropland share or food export shares) highlights the urgent need for adaptive strategies in water and land management in the region.

Figure 7 Most countries are facing increasing agricultural drought, threatening croplands and food exports

Average food exports (percentage of exports, 2018-2022) and cropland soil moisture anomaly (percentage change, 2020-2024 compared to the climate reference period 1981-2010). Bubble color reflects a country's share of cropland (percentage), while bubble size reflects cropland extent (km²).

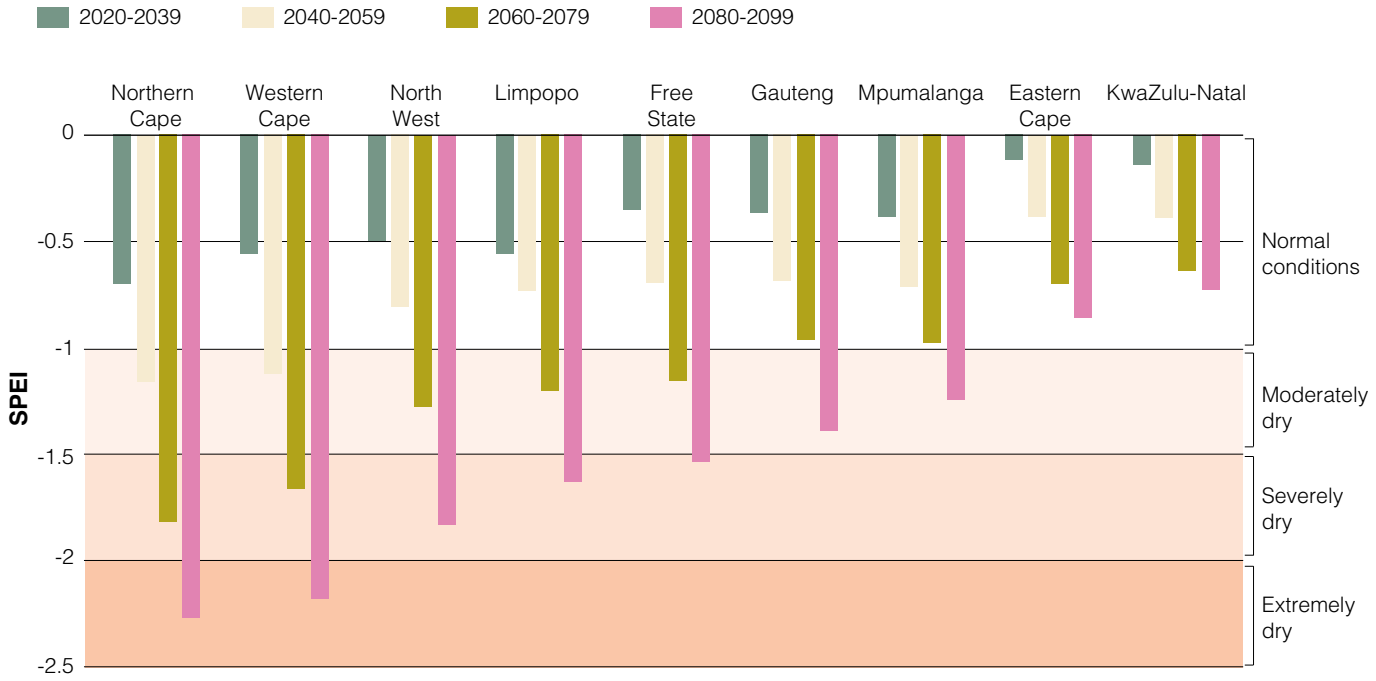


Note: Cropland soil anomaly describes the cropland soil moisture content in the topsoil layer compared to the climate reference period. Bubble size ranges from 15 100 km² of cropland for Burundi to 574 300 km² of cropland for Nigeria, 2022. Countries are listed in Endnotes.
Source: OECD (2025) "Climate-related hazards: Historical exposure to droughts", *OECD Environment Statistics* (dataset); OECD (2024), "Monitoring land cover change to understand biodiversity pressures", *OECD Environment Statistics* (dataset). Food export data from the World Bank's World Integrated Trade Solution system (World Bank, 2026[26]).

There is also substantial subnational variation in drought impacts, highlighting the need for a diverse set of adaptation strategies. In South Africa, for example, all large subnational regions are projected to experience worsening drought conditions across croplands throughout the century under the high emissions scenario (Figure 8) (OECD, 2025) (Onyeuwaoma, Sivakumar and Bade, 2024[27]). The Standardized Precipitation Evapotranspiration Index (SPEI) is well suited to monitor longer-term drought conditions by measuring the water deficit for the preceding 12 months. The Northern and Western Cape regions of South Africa are projected to experience extremely dry conditions on cropland, while the regions of Free State, Limpopo and North West are projected to experience severely dry conditions on cropland by 2100 under the high emissions scenario (Figure 8). This indicates that cropland impacts are not projected to be uniform within South Africa. Detailed subnational analyses for other African countries could better inform decision makers on where subnational risks to long-term droughts are likely to be the gravest.

Figure 8 By 2100, all South African subnational regions are projected to experience worsening drought conditions on cropland

Projected Standardized Precipitation Evapotranspiration Index (SPEI) values on cropland under the high emissions scenario (SSP3-7.0), midpoint averages in 2020-2039, 2040-2059, 2060-2079 and 2060-2099 compared to 1995-2014.



Note: The SPEI, a multiscale index representing a measure of the integrated water deficit for the preceding 12 months, is widely recognized as a comprehensive measure of drought. The indicator is particularly well suited to evaluate the impact of climate change on longer-term drought conditions. It considers both precipitation and potential evapotranspiration, capturing the influence of rising temperatures on drought conditions better than indices that rely solely on precipitation. SPEI values between 1 and -1 are typically considered as normal conditions. Values between -1 and -1.5 indicate moderately dry, between -1.5 and -2 severely dry and below -2 extremely dry conditions.
Source: OECD (2025), "Climate-related hazards: Projected exposure to droughts", *OECD Environment Statistics* (dataset). Underlying projected data based on CMIP6 multi-model ensembles come from the World Bank (Climate Change Knowledge Portal, 2024[21]).

The subnational South African region Free State has already been affected by extreme drought events, with direct observable impacts on the agricultural sector. Both maize and sorghum production have been at their lowest in Free State during extreme drought events (Orimoloye, 2022[28]), with maize production reaching a record low in 2014 and 2015. Meanwhile, sorghum production recorded its lowest productions in 2015, 2016 and 2019. These results confirm that past drought years have already led to lower agricultural yields, potentially affecting food security in South Africa and the broader region.

Extreme rainfall and flooding continue to cause havoc

There are various ways one can measure extreme precipitation, each capturing different aspects of the weather event. The highest one-day precipitation amount, for example, measures the maximum amount of daily precipitation over a given period, while the highest five-day cumulative precipitation measures the maximum amount of precipitation over a cumulative five-day period. Meanwhile, very heavy precipitation days measure the number of days where daily total precipitation exceeds 20 mm. Analyzing all three metrics together provides a more comprehensive view of potential changes in extreme precipitation events than analyzing each metric individually.

Overall exposure to extreme precipitation is projected to increase across the selected African countries, except for Cabo Verde. This finding is consistent across multiple indicators (Figure 9) (OECD, 2025). Each indicator measures the magnitude of change but differs markedly by country.

Countries such as Egypt, South Africa and Morocco are projected to experience relatively modest increases of extreme precipitation. Conversely, Uganda, Ethiopia and Sierra Leone are projected to experience the largest increases of extreme precipitation across the selected African countries (Figure 9). These cross-country differences suggest that the continent will not face uniform impacts from extreme precipitation. Consequently, subnational analyses would be beneficial for informing targeted adaptation measures where risks are likely to be greatest.

Figure 9 Most countries are projected to experience an increase of extreme precipitation, but impacts are not uniform

Change in (i) the highest one-day precipitation amount (mm); (ii) the highest five-day cumulative precipitation amount (mm); and (iii) the number of very heavy precipitation days (days/year) under the intermediate-emissions scenario (SSP2-4.5) across selected African countries, 2040-2059 and 2080-2099 compared to 1995-2014.

Note: Selected countries are listed in Endnotes.
Source: OECD (2025), "Climate-related hazards: Projected exposure to extreme precipitation", *OECD Environment Statistics* (dataset). Underlying projected data based on CMIP6 multi-model ensembles comes from the World Bank (Climate Change Knowledge Portal, 2024[21]).

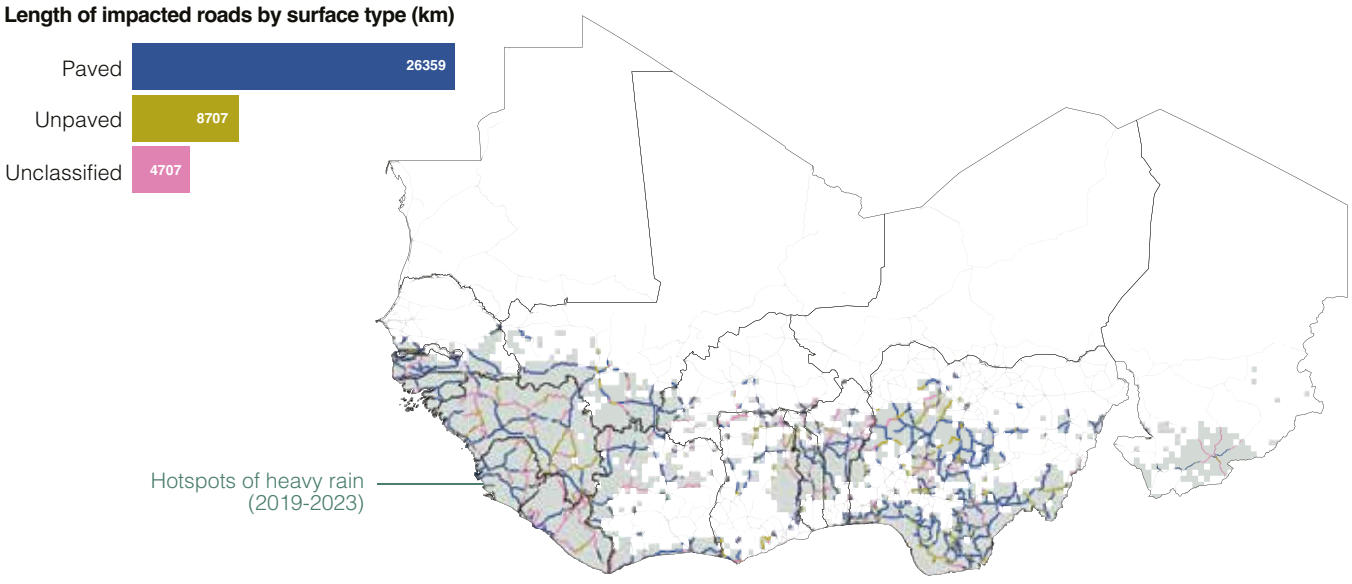
Box 3. Coping with extreme precipitation to ensure regional connectivity

Extreme precipitation affects African regions unevenly, making it essential to prioritize resilience investments in areas most exposed to very heavy rainfall while still considering the needs of less-developed regions. Roads are critical to regional connectivity in Africa. In addition to connecting city clusters with rural areas, they support more than 80% of transported goods and 90% of passenger traffic across the continent (OECD/UN ECA/AfDB, 2022[29]; AFC, 2024[30]). In West Africa, roads form the backbone of development corridors, including those outlined in the West African Economic and Monetary Union's Schéma de Développement de l'Espace Régional 2021-2040. Intensifying rainfall increasingly disrupts these networks, highlighting that climate resilience is also a major economic concern. The analysis extracted the main road network (motorways, trunk roads and primary roads) from Open Street Map and combined it with the Heidelberg Institute for Geoinformation Technology Global Road Classification to identify paved and unpaved surfaces. Extreme-precipitation zones were defined as areas in the regional top 10% of very heavy rain-day frequency during the monsoon season, i.e. locations experiencing 11 or more days per year with rainfall exceeding 20 mm, based on 2019-2023 data. Some areas record up to 65 of such days annually. This threshold approach follows methods used by the Intergovernmental Panel on Climate Change and the World Meteorological Organization.

Today, 42% of West Africa's roads – 39 773 of 95 573 km – lie within extreme-precipitation zones (Figure 10). Among the exposed roads, 26 359 km are paved, 8 707 km are unpaved and 4 707 km are unclassified. Unpaved roads are especially vulnerable, as intense and prolonged rainfall drives washouts, erosion and pothole formation (Valencia-Gallego and Montoya, 2024[31]).

Figure 10 Main roads highly exposed to heavy rain over the last five years

Geographical overview of affected roads in West Africa and length of affected roads (km) by surface type

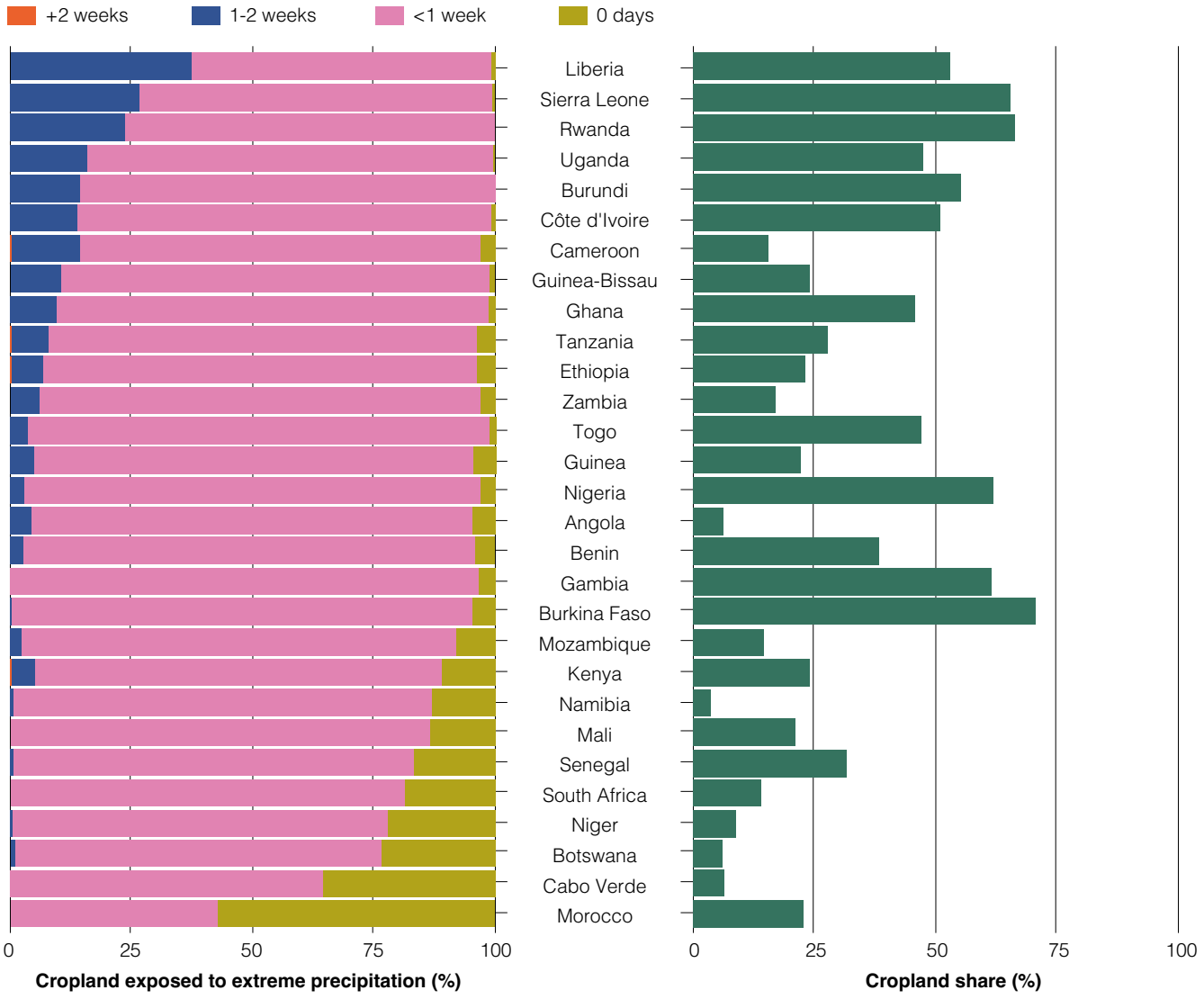


Note: Dark blue represents paved roads that fall in the hotspots of heavy rain; yellow represents unpaved roads that fall in the hotspots of heavy rain; and pink represents unclassified roads that fall in the hot spots of heavy rain i.e. it is unclear whether these roads are paved or unpaved. Those roads that fall outside the hotspots of heavy rain are in gray.
Source: OECD/SWAC (forthcoming), *Atlas of Urban Futures and Climate Hazards in West Africa.*

Over 50% of cropland is exposed to extreme precipitation across the selected African countries (except for Morocco), with many countries experiencing such conditions across nearly all their cropland. Croplands can be particularly vulnerable to extreme precipitation. Heavy rainfall can cause erosion of fertile topsoil, prolonged waterlogging and crop loss, while disrupting planting cycles and reducing overall productivity. Countries such as Liberia and Sierra Leone faced more than a week of these extreme-precipitation events over the observed period (Figure 11) (OECD, 2025). The Great Lakes region, encompassing Rwanda, Uganda and Burundi, is particularly affected, highlighting a significant vulnerability in this area. Cross-referencing extreme-precipitation exposure with the percentage of cropland cover (right panel of Figure 11) shows that several of these countries also dedicate a substantial share of land to agriculture.

Figure 11 High share of cropland exposed to extreme precipitation across the continent

Average share of cropland (as percentage) exposed to ***n*** number of weeks of extreme precipitation for selected African countries, 2020-2024 average



Note: The frequency of extreme precipitation events is measured here as the number of days where daily precipitation values exceed the 99th percentile over the climate normal (1981-2010) for a given country (EEA, 2021[32]). Selected countries are listed in Endnotes.
Source: OECD (2025), "Climate-related hazards: Historical exposure to extreme precipitation", *OECD Environment Statistics* (dataset).

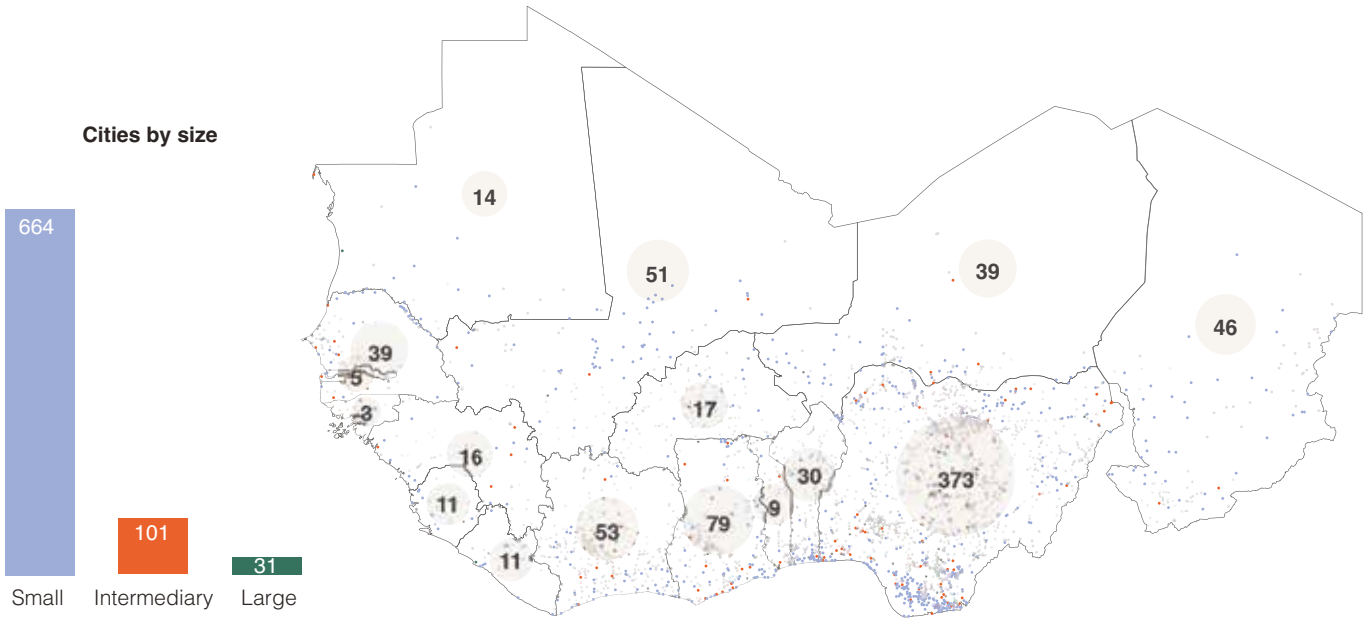
For instance, countries like Burkina Faso and Nigeria (alongside those already cited within the Great Lakes region) experience high exposure to extreme precipitation and also have a large extent of cropland. This underscores the potential impact on their land and agricultural sectors. The dual threat of droughts and extreme precipitation thus poses a considerable risk to food security and agricultural exports in these nations. The increase in these extreme events underscores the urgent need for effective climate adaptation strategies to safeguard food security and maintain economic stability in the face of increasing climate variability.

Flooding in cities from heavy rainfall disrupts access to critical infrastructure and economic opportunity. Flooding is one of the most frequent consequences of heavy rain. However, the frequency and intensity of rainfall alone does not determine flood risk. The vulnerability of urban areas to floods is shaped by the characteristics of the built environment (e.g. the extent of impervious surfaces, the availability of drainage infrastructure, and the presence of green and blue spaces), topography, soil permeability and climatic conditions. These factors influence a city's capacity to absorb and manage water flows, interacting with quantity of rainfall to shape flood dynamics. As a result, even moderate precipitation can lead to severe flooding in some urban areas.

Flood risk is emerging as a critical concern for urbanization across West Africa. For example, 796 urban agglomerations in the region are potentially exposed to major flood events (Figure 12): 664 small cities, 101 intermediary cities and 31 large cities. This widespread exposure underscores the need for cities of all sizes to prepare for flood risks. This is especially crucial since cities offer greater economic opportunities than rural areas and provide access to essential services and critical infrastructure.

Figure 12 Many cities are at risk of flooding, potentially disrupting access to critical infrastructure

Estimated distribution of small (light blue), intermediary (yellow) and large (dark green) urban agglomerations affected by a 100-year return period flood hazard. The numbers indicate the number of urban agglomerations projected to be affected in each country.



Note: A flood event with a 100-year return period has a 1% probability of occurring in any given year.
Source: OECD/SWAC (forthcoming), *Atlas of Urban Futures and Climate Hazards in West Africa.*

Sea-level rise poses a distinct and compounding threat to Africa's rapidly growing coastal populations. The pace of global sea-level rise has doubled since the early 1990s, underscoring the extreme risk of coastal inundation over coming decades (Hamlington et al., 2024[33]). At least 55 million Africans live less than 10 meters above sea level (World Bank Group, 2018[34]) and by 2030, around 116 million Africans could live in densely populated, low-lying coastal areas (Willima and Dahir, 2023[35]). Major agglomerations such as Lagos, Dar es Salaam, Abidjan and Maputo are situated in low-lying zones where even modest increases in mean sea level amplify the frequency and severity of coastal flooding, storm surges and saltwater intrusion into freshwater aquifers and agricultural land. The West African coast could experience sea-level rises of up to 1.06 meters by 2100, with over 5 500 km^2 of coastal land flooded by mid-century and 6 650 km^2 by end of century (World Bank Group, 2020[36]; Schmidt and Muggah, 2021[37]). For cities where large informal settlements occupy flood-prone coastal margins, the intersection of sea-level rise with inadequate drainage, land subsidence and unplanned development creates compounding vulnerabilities that disproportionately affect the poorest urban residents.

Coastal erosion, driven by the combined effects of rising seas, changing wave climates and sediment supply disruption from upstream dam construction and sand mining, is already reshaping Africa's shorelines with significant economic and social consequences. A World Bank study found that environmental degradation, including flooding, erosion and pollution, in the coastal areas of Benin, Côte d'Ivoire, Senegal and Togo cost USD 3.8 billion in 2017, equivalent to 5.3% of the four countries' combined GDP, while causing more than 13 000 deaths annually (Croitoru, Miranda and Sarraf, 2019[38]). Across these four countries, an estimated 56% of the coastline is subject to an average erosion rate of 1.8 meters per year. Every year, an average of 500 000 people in West Africa are adversely affected by coastal erosion, with some areas experiencing coastline retreat of 20 meters or more per year (World Bank Group, 2018[34]). As West Africa's coastal areas host about one-third of the region's population and generate 56% of its GDP, the economic stakes are extremely high. Without integrated coastal zone management that accounts for climate projections, continued unplanned urban expansion into erosion-prone and flood-susceptible coastal areas risks locking in exposure to escalating losses. Strengthening coastal monitoring systems, incorporating sea-level rise projections into urban and infrastructure planning, and protecting or restoring natural buffers such as mangroves and barrier systems will be essential components of a climate-resilient development pathway for Africa's coastal regions.

2.2 The benefits of adaptation

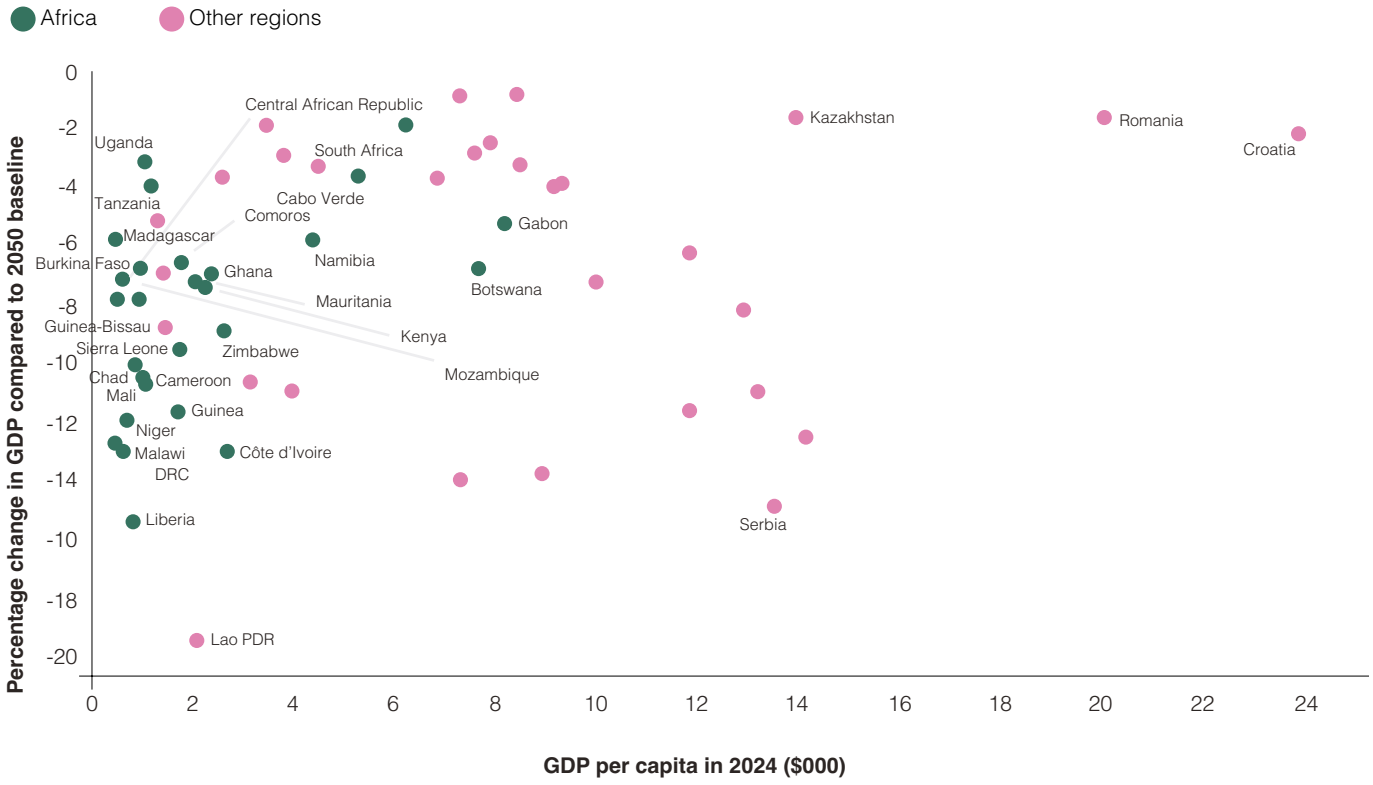
The lowest-income economies in Africa stand to bear some of the heaviest economic costs of climate change, with consequences that threaten the foundations of human welfare. According to the World Bank's Country Climate and Development Reports (CCDRs), many African countries are projected to face some of the most severe economic impacts from climate change (Figure 13). In countries such as Niger, Malawi, Côte d'Ivoire and the Democratic Republic of Congo, climate-related damages could exceed 10% of GDP by 2050 in the absence of effective adaptation. For economies that are already among the lowest in per capita income globally, such losses would place substantial pressure on livelihoods, undermine job creation and erode income security. Moreover, equivalent percentage losses in low-income settings tend to translate into far more acute human consequences through heightened food insecurity, increased vulnerability to shocks, and setbacks in health and education

outcomes. This asymmetry was underscored in recent global assessments, including the World Bank Group Scorecard's climate risk indicator.[3]

The increasing frequency of climate events raises the risk of multiple shocks occurring in quick succession, with potentially large aggregate impacts. Multiple shocks have cost up to 10% of GDP for small islands such as Mauritius (World Bank Group, 2026[39]).

Such scenarios are increasingly recognized as important to stress-test systems and identify pathways to manage and prioritize critical risks that can add to climate change impacts. With the world economy becoming more shock-prone and climate shocks becoming more frequent and intense, the risk of compounding shocks is increasing, necessitating action to strengthen African countries' economic resilience.

Figure 13 Estimated GDP losses from key climate impact channels by 2050



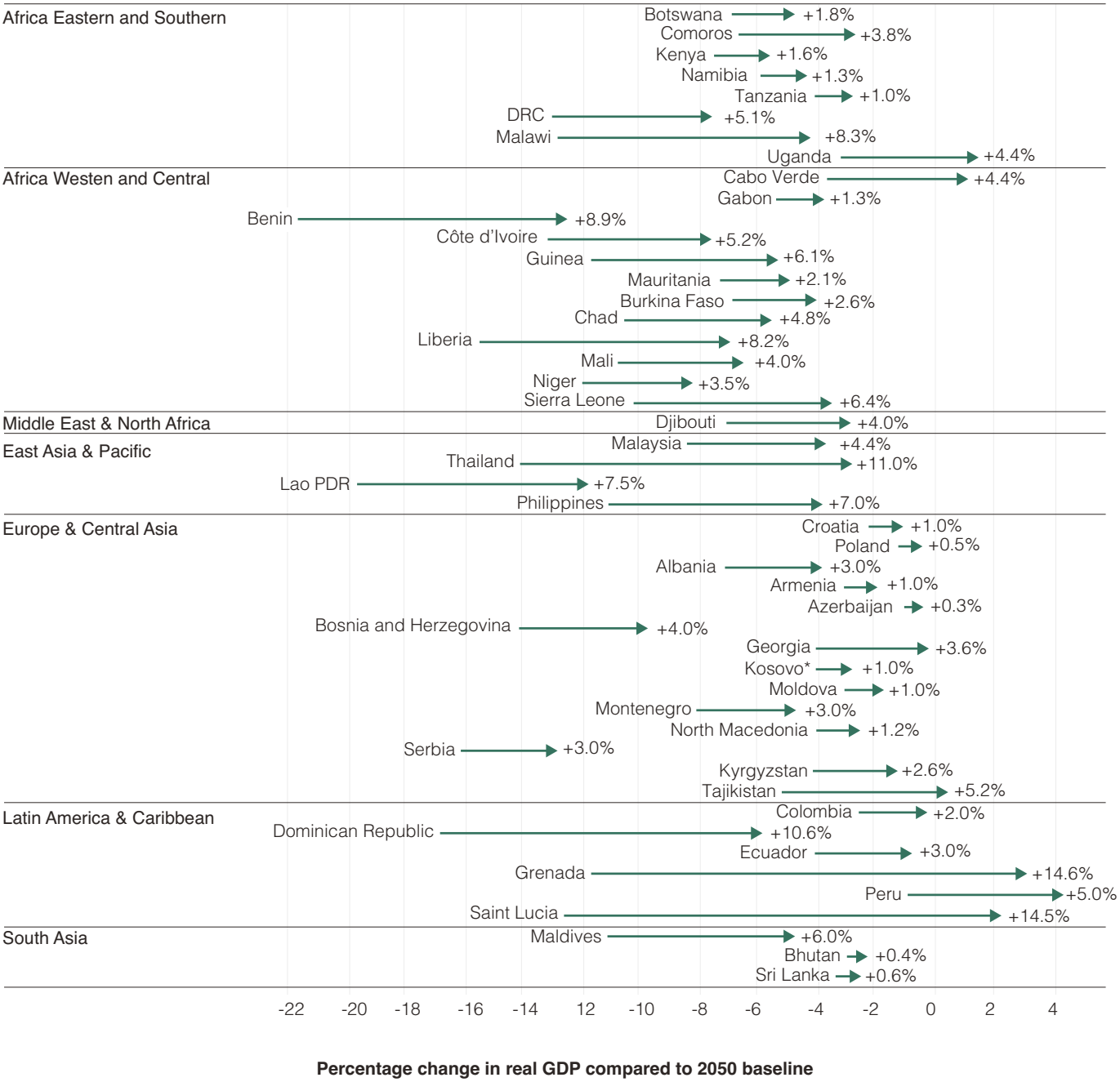
Source: World Bank Country Climate Development Reports.

Strategic adaptation interventions can substantially reduce climate-related economic losses, while also delivering broader development gains for health, equity and human development. Well-designed adaptation interventions can significantly reduce potential climate damage-related losses and in some cases even deliver economic gains (see Figure 14).

These interventions include investments in physical infrastructure (energy, transport, water, digital, buildings), people (education, health, social protection) and nature (watershed management, land restoration). They also include improving enabling conditions such as access to technology, sound regulations and adequate finance, including disaster-risk financing instruments.

The benefits of adaptation extend well beyond reduced economic losses to include improved health outcomes, strengthened human capital and enhanced long-term inclusion. For example, the World Bank's CCDR for Uganda underscores the importance of strengthening the country's health system to alleviate the burden of climate change-induced disease and infrastructure, while improving preparedness for disease outbreaks. Similarly, the CCDR for Madagascar highlighted how adaptation investments in education, skill development and training programs can help address skill gaps and support inclusion, particularly for women and youth.

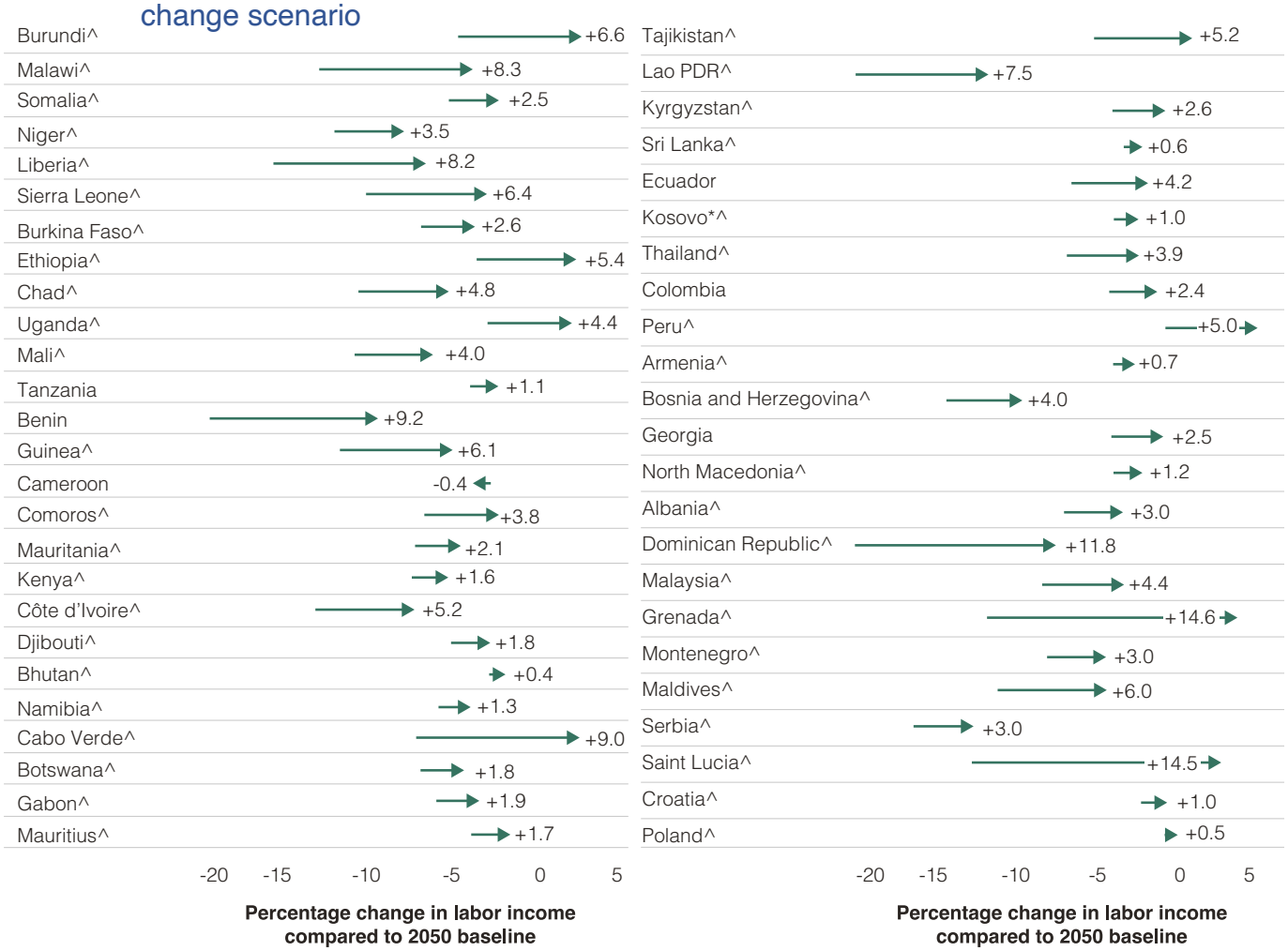
Figure 14 Economic benefits from adaptation interventions



Note: The beginning of each arrow indicates the estimated percentage in 2050 real GDP in a scenario that does not include adaptation interventions as set out in the Country Climate Development Report (CCDR), while the end of the arrow shows the change with CCDR adaptation measures.
Source: Based on recommendations in World Bank Country Climate and Development Reports (Hill et al., 2025[10]; Middelanis et al., 2025[40]).

Adaptation interventions can also boost employment and labor income. In a future dry and hot climate scenario, many African countries could see substantial increases in labor income with adaptation measures compared to business as usual (Figure 15). This is particularly significant in economies where a large share of employment remains concentrated in climate-exposed sectors. In agriculture, for example, heat stress and erratic rainfall already weigh heavily on worker productivity. By investing in irrigation, improved crop varieties and rural infrastructure, adaptation can stabilize agricultural incomes. At the same time, it can create new employment opportunities in the broader transition to a low-carbon, resilient economy. For women and youth, who are disproportionately represented in vulnerable informal and agricultural work, these labor income gains carry especially important implications for equity and inclusion.

Figure 15 Impact of adaptation interventions on labor income by 2050 under a dry/hot climate change scenario



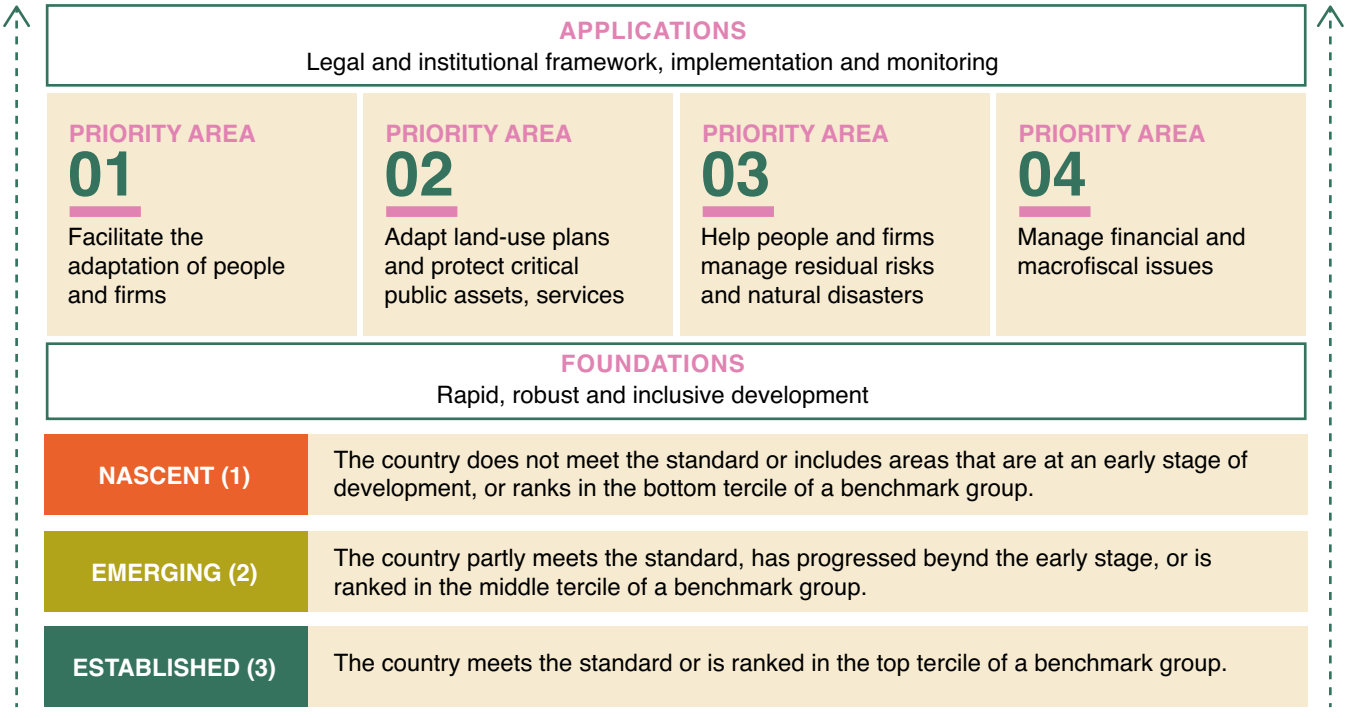
Note: The beginning of each arrow indicates the estimated percentage change in labor outcome without adaptation measures set out in the Country Climate Development Report (CCDR), while the end of the arrow shows the change with CCDR adaptation measures.
Source: Based on measurements in World Bank Country Climate and Development Reports.

2.3 Evaluating adaptation readiness across countries to manage climate risks

Resilience must go beyond building stronger infrastructure to embrace a whole-of-society approach. Building adaptation readiness means more robust policies and institutions, ensuring reliable climate risk information is available and accessible, strengthening cross-sectoral coordination, mobilizing finance and creating systems that can deliver effective implementation. To help countries advance on these fronts and prioritize action, the World Bank developed the Adaptation and Resilience (A&R) Readiness Assessment. This diagnostic provides a whole-of-economy view of a country's readiness to anticipate, absorb and recover from climate shocks.

The A&R Readiness Assessment is grounded in the World Bank's *Adaptation Principles* (Hallegatte, Rentschler and Rozenberg, 2020[43]), a framework that reflects universal principles for effective climate change adaptation and building resilience that are relevant for all countries. It is built around six pillars: building resilient foundations through rapid and inclusive development; facilitating the adaptation of people and firms; adapting land use and protecting critical public assets and services; increasing the capacity of people and firms to cope with and recover from shocks; anticipating and managing macroeconomic and fiscal risks; and ensuring effective implementation with a robust governance structure and continuous monitoring (Figure 16). Each pillar is underpinned by a set of priority actions corresponding to policy domains and key aspects of the enabling environment required for effective adaptation. The tool uses a traffic light system to rate progress on a set of quantitative and qualitative indicators drawn from global data, public documents and expert judgment.

Figure 16 The Adaptation Principles framework



Source: Hallegatte, Rentschler and Rozenberg (2020[43]).

The A&R Readiness Assessment is a practical tool to guide policymakers in strengthening national adaptation and resilience systems. This assessment can help decision makers, such as climate change coordinating bodies and central ministries, establish or improve the enabling conditions and policy interventions and implementation for improved A&R preparedness. The approach complements detailed sectoral assessments and can be adapted to reflect a country's A&R priorities, such as those identified in their National Adaptation Plans, Nationally Determined Contributions or long-term strategies.

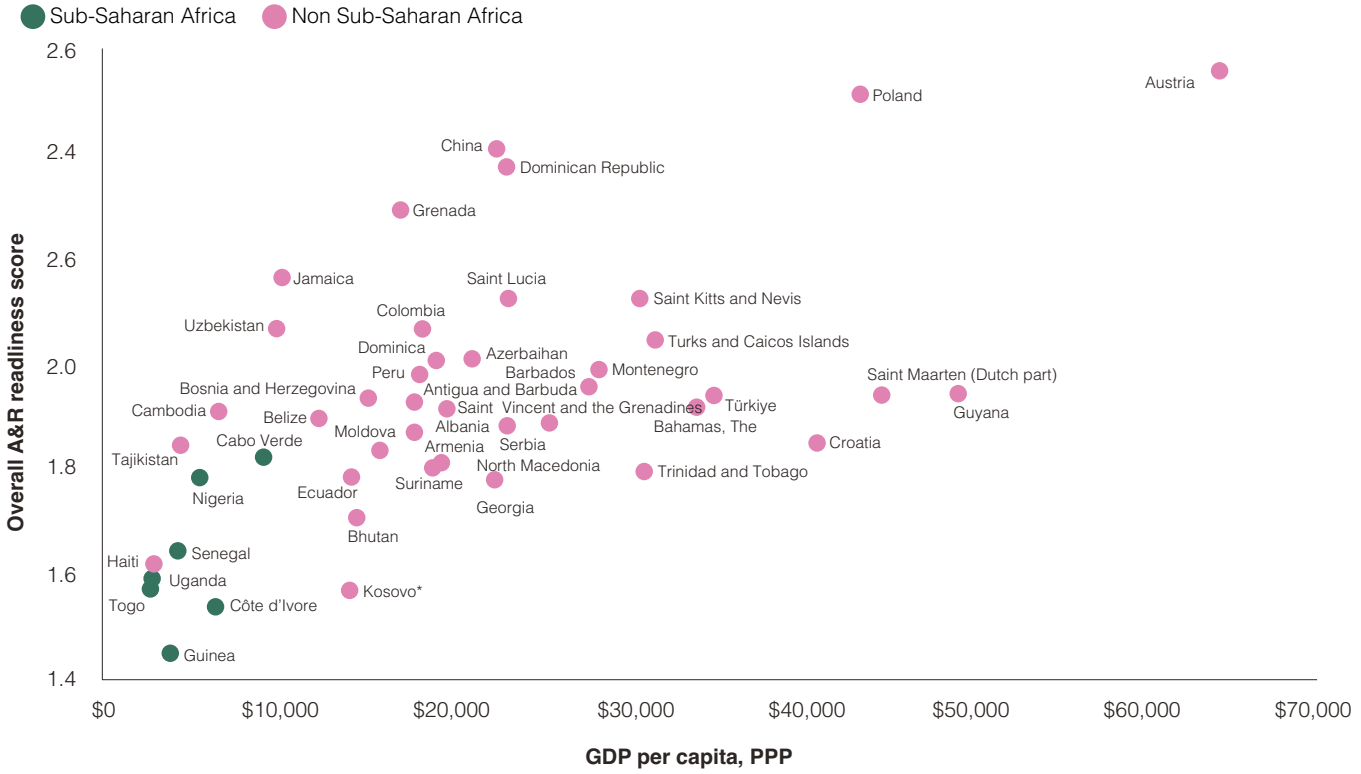
A&R readiness assessment results, with a focus on sub-Saharan Africa

According to A&R Readiness Assessments, climate risks are increasing, but countries have different vulnerabilities depending on their context and capacity. As of June 2025, the World Bank has completed 46 assessments across regions and income groups. All countries face rising climate risks, although the degree of vulnerability varies with geography; frequency and intensity of hazards; population exposure; economic activities; infrastructure; and the country's capacity to withstand and respond to changing climate conditions.

Adaptation and resilience readiness is positively correlated with greater economic development – but income isn't everything

Economic development is a critical enabler of adaptation and resilience. Wealthier, more economically stable countries are better able to respond to shocks, anticipate future risks and stresses, and invest in adaptation and resilience. The country assessments confirm this trend: countries like Austria, Poland, the Dominican Republic and the People's Republic of China – all high income and upper middle-income countries – exhibit stronger A&R readiness. Conversely, lower-income countries, including in sub-Saharan Africa, have the lowest preparedness (Figure 17).

Figure 17 Overall A&R readiness score and GDP per capita, highlighting sub-Saharan Africa



Note: The A&R readiness assessment score provides a whole-of-government, whole-of-economy assessment of countries' A&R policy, institutions, capacity preparedness and implementation. The framework is organized along six pillars (see Figure 16), which has a set of priority actions corresponding to policy domains and key aspects of the enabling environment required for effective adaptation. These actions evaluated based on a mix of quantitative and qualitative indicators, which are assessed and assigned a score of 1, 2 or 3 according to the rating criteria using a range of information sources and methods, including benchmarking against peer countries and expert judgment.
Source: World Bank staff calculations, based on World Development Indicators and World Bank country A&R Readiness Assessments.

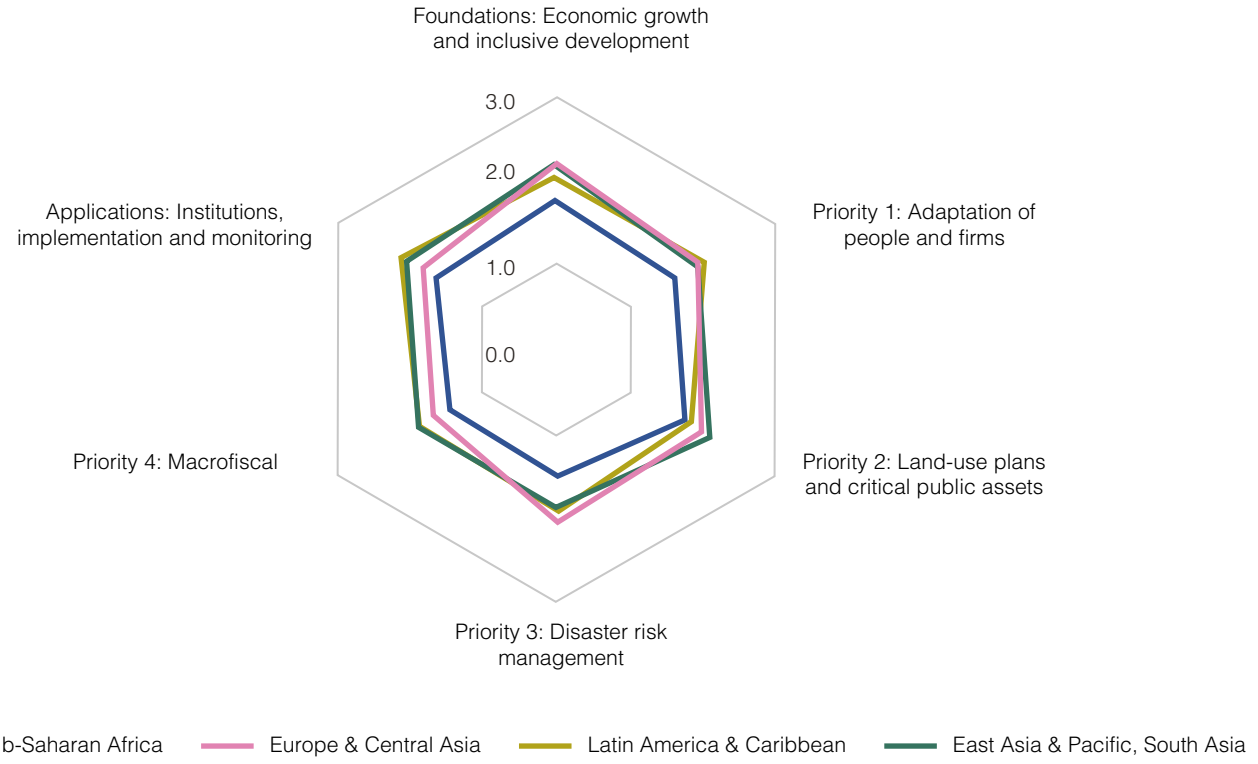
While development gaps constrain adaptation and resilience, they are not the only factor that matters. Readiness levels vary significantly among countries at similar income levels, particularly in the middle-income group. This suggests that income matters but is not destiny. Countries that make proactive policy choices, invest in capacity building and integrate adaptation into national planning can build resilience, even in the face of development constraints.

Compared to other regions, sub-Saharan Africa shows lower A&R readiness across all pillars despite facing some of the highest climate risks

When assessing regional averages across the A&R readiness framework, sub-Saharan Africa performs the lowest across all pillars (Figure 18). While this reflects the slightly skewed income group distribution of this limited set of countries, it highlights the urgent need for the region to build climate resilience in the face of rapid population growth, urbanization and infrastructure needs.

In sub-Saharan Africa, close to 40% of the population is at high risk from climate hazards – the highest share of any region (Hill et al., 2025[10]). These communities in sub-Saharan Africa are more likely to face floods, droughts or extreme heat, and also lack the basic systems needed to cope and recover. Many do not have access to bank accounts, electricity, piped water or any form of social protection coverage. Moreover, while most regions saw significant improvements in risk exposure over the past decade, progress in sub-Saharan Africa has only been marginal, underscoring the urgent need for targeted action.

Figure 18 Average scores by pillar in sub-Saharan Africa compared to other regions



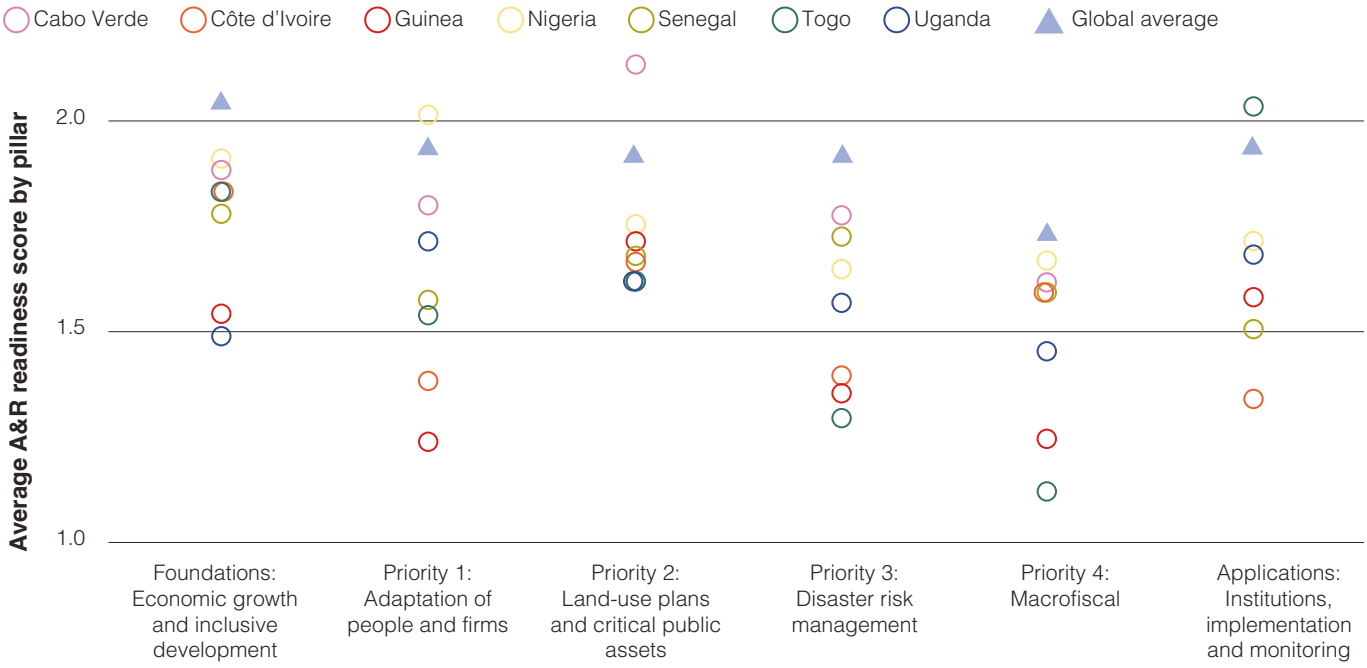
Source: World Bank staff calculations, based on World Bank country A&R Readiness Assessments.

Sub-Saharan African countries have made important progress in strengthening resilience, but significant challenges remain. Overall, the assessments show that sub-Saharan countries have demonstrated substantial effort in planning and implementing A&R interventions. However, there are still major gaps in mainstreaming A&R and countries especially struggle to adopt a whole-of-society approach. While countries have made notable progress in developing strategies and institutional arrangements for resilience and adaptation, large implementation gaps remain at sector level. This is particularly visible in land use, basic infrastructure and social services. Countries are also showing the least progress in addressing macro-fiscal issues (Priority 4). This gap highlights the technical and capacity challenges in identifying, quantifying and managing macro-fiscal risks posed by climate impacts, including risks to macroeconomic stability, public finances, debt sustainability and the financial sector. Lastly, more proactive action is needed. Reactive adaptation response and recovery still tend to be the norm in many countries, which can be costly to both the economy and society.

Within sub-Saharan Africa: Who is leading and where are the gaps?

While most sub-Saharan African countries included in this analysis lag behind the global average, there are promising signs of leadership and innovation. Figure 19 shows pillar-by-pillar analysis of country-level ratings.

Figure 19 Average A&R readiness score by pillar for sub-Saharan African countries and the global average



Note: Each indicator is assigned a score of 1 (nascent), 2 (emerging) or 3 (established) using a range of information sources and methods, including benchmarking against peer countries and expert judgment, and then aggregated with equal weight for each priority area and pillar. Each circle represents a country's average score in the corresponding pillar, and the global average is represented with a blue triangle.
Source: World Bank staff calculations, based on World Bank country A&R Readiness Assessments.

In Priority 1, on incentivizing people and firms to adapt to future climate change, Nigeria outperforms the global average. Nigeria has a system in place to identify vulnerable populations and make targeted interventions, as well as policies that encourage digital and technological solutions to overcome information, regulatory and behavioral barriers to adapt to climate change. This is promising as Nigeria is also

one of the countries highly exposed to hot days in cities and flooding (see previous section). By contrast, Guinea lags on this pillar with room for improvement in developing and publishing national-scale hazard maps, building on its limited network of hydromet stations. However, promising efforts are under way. The government's National Development Strategy includes a target to create at least 15 000 green jobs by 2040, with a focus on ecotourism. Realizing this ambition will require stronger access to finance, clearer private sector climate policy action plans and enhanced institutional support to unlock investment in climate-resilient sectors.

In Priority 2, on sectoral implementation of adaptation and resilience, most sub-Saharan countries score similarly, reflecting common gaps in protecting public assets, developing land-use plans and managing natural environments (land, air and oceans). Cabo Verde is a clear outlier in Priority 2, scoring higher than both regional peers and the global average. As an upper middle-income and tourism-dependent small island developing state, it has taken steps to make local jobs and livelihoods more resilient to climate impacts. The country has a spatial data infrastructure within the National Institute for Territorial Management for integrated coastal zone management. It has also established policies for a national network of protected areas, and is developing tourism development plans for certain areas. For its part, Nigeria is harnessing forests and vegetation to reduce vulnerability to soil erosion in targeted sub-watersheds. This, in turn, will enhance the resilience of infrastructure and livelihoods. While still facing some challenges, Guinea is building resilience through integrated water resource governance. The country has prioritized water as a driver of growth, socio-economic development and environmental protection. To that end, it has prepared a National Integrated Water Resources Management Plan to guide coordinated action in this sector.

In Priority 3, on helping people and firms manage residual risks and recover from natural hazards and climate shocks, there is room for improvement. Effective residual risk management requires a suite of systems, including hydromet, weather forecasting, early warning systems and coordinated emergency response plans. In Guinea, the disaster-risk management institutional and regulatory framework is fragmented, with the Disaster Management Law yet to be updated in 30 years. Further, the lack of interoperable data systems between the Social Development and Poverty Fund and the Public Works department is a barrier for adaptive social protection.

Overall, SSA country readiness is lowest for Priority 4 on managing financial and macro-fiscal risks from climate change. Most countries lack the systems and capacity to plan for the long-term impacts of climate change, leaving public finances, debt sustainability and financial systems vulnerable. Key tools, such as incorporating contingent liabilities into fiscal plans, climate-linked budget tagging and developing climate-informed financial sector strategies, remain underused across the region. Despite these gaps, there are encouraging signs of progress. Togo has begun to consider climate objectives in its budget with nine ministries tagging climate-related expenditures. However, further efforts are needed to embed climate considerations into public investment management and public procurement. Meanwhile, Uganda has taken a leadership role at the global level as the co-chair of the Coalition of Finance Ministers for Climate Action. Domestically, a major policy operation by the World Bank's Governance team is supporting the country in strengthening climate-informed public investment management – a critical step toward building macro-fiscal resilience.

Finally, most countries in sub-Saharan Africa lag the global A&R average rating in setting up institutional and legal frameworks that outline the government's approaches, targets and systems for implementation, monitoring and tracking (Applications). Only several countries in the region have adopted formal National Adaptation Plans, with fewer still putting in place processes for financing and

implementation. Translation of national adaptation priorities to the sector and subnational levels remains limited across the region. Togo has made progress with a climate-conscious development strategy that integrates adaptation actions, policies and targets into its Government Roadmap 2020-2025 and National Climate Change Adaptation Plan. However, gaps remain in allocating sufficient climate adaptation finance and monitoring progress over time. By contrast, Uganda can operationalize its National Climate Finance Strategy. It identifies various avenues for mobilizing climate finance, including domestic public finance, international climate finance and domestic private sector finance.

Adaptive social protection for climate resilience in Africa: Insights from Malawi and Ethiopia

Climate change is driving more frequent and severe climate shocks across Africa, threatening vulnerable populations and jeopardizing progress toward inclusive and sustainable development. Traditional social protection systems remain vital. However, they are increasingly overstretched and often ill-equipped to respond to the scale and complexity of today's risks. To illustrate how these policy themes play out in practice, the section draws briefly on country experiences from Malawi and Ethiopia. Adaptive Social Protection (ASP) offers a more forward-looking and integrated approach. By combining social protection with disaster-risk reduction and climate change adaptation, ASP goes beyond reactive safety nets. It helps countries anticipate, absorb and adapt to both sudden shocks and longer-term socio-economic and environmental stresses.

Importantly, ASP recognizes that poverty is both a condition of low income and the result of chronic exposure to overlapping risks, particularly in rural, climate-vulnerable settings. Through a combination of anticipatory, protective and adaptive measures, ASP supports households in managing risk, protecting assets and strengthening resilience over time.

This case study explores how two African countries – Malawi and Ethiopia – are pioneering ASP approaches in response to rising climate vulnerability. While differing in context and design, both countries offer practical lessons on how to deliver timely, scalable support to at-risk populations, build shock-responsive systems and integrate social protection into broader national resilience strategies. Many more examples of adaptation and resilience-building examples are documented in the WBG's Adaptation and Resilience Solutions in Action series, which features case studies demonstrating how countries around the world are addressing climate risks (World Bank, 2024[44]). This "living" repository is updated on an ongoing basis, reflecting new successful initiatives and innovations that could be applied in other country contexts.

Malawi: Financing early action through scalable safety nets

Malawi is highly exposed to climate hazards. In the past decade alone, droughts and floods have caused damages equivalent to over 10% of GDP. Traditional disaster responses, which rely on emergency aid and budget reallocations, have often been too slow, too costly and too uncertain to protect households from slipping into deeper poverty.

To address this challenge, Malawi has linked its national social protection program to a pre-financed, shock-responsive mechanism. Anchored in its Disaster Risk Financing Strategy, the Ministry of Finance, Economic Planning and Decentralization has developed a scalability mechanism that automatically expands cash transfers in response to drought.

Supported by the World Bank's USD 495 million Social Support for Resilient Livelihoods project, the mechanism is activated based on satellite rainfall data and other objective indicators. When thresholds are crossed, emergency cash transfers are released based on pre-agreed, transparent rules and pre-positioning financing instruments.

The government also developed a financing plan informed by cost analysis and likelihood

of drought events. After reviewing the cost efficiency of different climate and disaster-risk financing instruments, it selected a layered approach: a contingency fund for less severe droughts and a risk transfer instrument for more extreme events. The insurance premium was funded by a Global Shield Financing Facility grant, which explicitly tested the use of insurance to help meet scalability needs. Once drought indicators are triggered, funds are released from both instruments to support additional transfers.

Results and lessons

- In its first two years, the mechanism delivered additional support to nearly 85 000 households across six drought-prone districts.
- Transfers were timed to precede seasonal food price spikes, allowing households to purchase up to three times more maize than they would have with delayed support.
- The program has enhanced budget predictability, institutional coordination and delivery system readiness, including digital payments and streamlined registration.
- By investing in delivery systems, objective triggers and risk financing tools, Malawi has laid the groundwork for a scalable, nationwide shock-responsive system capable of addressing a wider range of climate-related shocks.

Ethiopia: Building long-term resilience through productive safety nets

Ethiopia's economy and rural livelihoods are deeply reliant on natural resources, yet these are increasingly undermined by climate change. Droughts, erratic rainfall, land degradation and food insecurity remain persistent threats, particularly for lowland and highland rural populations.

Launched in 2005, Ethiopia's Productive Safety Net Program (PSNP) has grown into one of the largest adaptive safety nets in Africa, reaching nearly 8 million people annually. The PSNP offers predictable food or cash transfers to extremely poor households living in districts characterized by high levels of poverty and food insecurity. Beneficiaries are identified using program-defined criteria, with local communities playing a central role through participatory wealth ranking and the use of local knowledge. This ensures that targeting is context-specific, inclusive and transparent.

Households with able-bodied members participate in public works that are explicitly designed to support climate adaptation. These works include soil and water conservation, flood protection and rangeland restoration, and investments in other climate-adaptive infrastructure. Labor-constrained households receive unconditional support. The PSNP is also designed to scale up rapidly in response to drought, temporarily enrolling an additional 210 million people when early warning systems indicate rising risk.

Beyond immediate support, the PSNP includes a comprehensive livelihoods package. Beneficiaries receive training, financial literacy support, and access to capital or credit. This helps households diversify income, build savings and move toward self-reliance.

Results and lessons

- Impact evaluations every two years demonstrate that households with multi-year PSNP participation maintained food security even through repeated droughts.
- PSNP participants were significantly less likely to sell assets during shocks and reported improved dietary diversity and school attendance.
- Livelihood support has increased household savings (an increase from 33% before joining the program to 75% after), asset accumulation and uptake of modern agricultural practices.
- Environmental works have improved soil fertility, groundwater recharge and access to water in both highland and lowland areas.

2.4 Summary and next steps

Across Africa, climate risks are rising faster than the capacity to manage them, with the heaviest burdens falling on those least able to absorb them. The evidence presented in this chapter tells a consistent story: climate hazards across Africa are intensifying, the populations most exposed are often those least equipped to respond, and the human and economic costs of inaction are high. Heat stress, agricultural drought and extreme precipitation are all worsening. In the lowest-income settings, even moderate economic losses can translate quickly into food insecurity, reduced access to services and setbacks in living standards.

Yet the analysis also offers reasons for cautious optimism. Adaptation can be effective in reducing climate-related damages and in some cases can even generate net economic gains. Countries that have embedded climate resilience into their planning and financing systems are already seeing more robust outcomes. Moreover, evidence from World Bank CCDRs shows that targeted investment can meaningfully reduce losses and generate valuable gains for employment, health and inclusion.

Several priorities stand out for the period ahead:

Build a stronger evidence base for adaptation and resilience

One of the clearest gaps revealed by this chapter is the lack of systemic, comparable data on what adaptation policies and resilience initiatives are being implemented across the continent, and whether they are working. Hazard monitoring has advanced considerably, and the next chapter extends the analytical lens to mitigation. However, adaptation intervention tracking has not kept pace. There is no standardized framework for classifying adaptation interventions across sectors and country contexts in a way that enables cross-country learning. The World Bank's A&R Readiness Assessment provides a strong methodological foundation, but with coverage of just seven African countries to date, it cannot yet support continent-wide analysis or benchmarking. This asymmetry between the depth of mitigation data and the scarcity of adaptation data is a structural constraint, not a reflection of lower policy importance. It underscores the need for sustained investment in adaptation data systems and diagnostics. Expanding this coverage, developing a formal adaptation policy taxonomy and investing in subnational data collection are near-term priorities. This is especially the case given that national averages, as shown repeatedly in this chapter, can mask the localized concentrations of risk where interventions matter most.

Turn plans into action

Many African countries have made real progress in developing adaptation strategies and institutional arrangements. The harder challenge is implementation – getting adaptation priorities to translate into land-use decisions, infrastructure investments and service delivery on the ground. This requires clearer lines of responsibility, stronger coordination between national and subnational levels, and better systems for tracking outcomes. Management of fiscal risks posed by climate change, including through climate budget tagging and contingent liability planning, also remains underdeveloped across much of the region and deserves more attention. While adaptation actions alone are cost effective, combining them with strategic development investments can deliver even greater economic benefits and reduce the short-term cost. The business case for resilience investments is compelling, with global studies indicating that each USD 1 spent results in long-term savings of USD 47 (Ferguson et al., 2022[45]).

Get finance to where it is needed

Even well-designed adaptation systems struggle without reliable funding. Closing the finance gap will require scaling up international climate flows; strengthening domestic resource mobilization; and expanding use of anticipatory financing instruments that can reach vulnerable households before shocks deepen into crises. Of course, finance needs to be paired with the institutional capacity to deploy it effectively and transparently.

While the adaptation priorities outlined in this chapter are key, they are not sufficient on their own to secure climate-resilient development pathways. Investments in energy systems, infrastructure, land use and urban development will shape both future emissions trajectories and countries' capacity to adapt to changing climate. This creates a policy design challenge: how to strengthen mitigation ambition without compromising urgent adaptation needs. Understanding how governments navigate this trade-off is therefore critical. The next chapter examines how African countries are addressing this challenge by tracking the evolution of climate mitigation action in terms of policy adoption and policy stringency.[4]

Endnotes

1 Discussion of results in this paper is limited to the 28 countries for which there are CAPMF data. They comprise Angola, Benin, Botswana, Burkina Faso, Cameroon, Cabo Verde, Côte d'Ivoire, Egypt, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Liberia, Mali, Morocco, Mozambique, Niger, Nigeria, Rwanda, Senegal, Sierra Leone, South Africa, Tanzania, Togo, Uganda and Zambia.

2 Africapolis is a research and data visualization tool used to map, analyze and understand urbanization and urban growth in Africa. It provides urban agglomerations boundaries for 2015 and 2020, as well as projections up to 2050 (OECD/SWAC, https://africapolis.org/en).

3 See Hill et al. (2025[10]), "One-fifth of the world's population at high risk from climate-related hazards", https://doi.org/10.21203/rs.3.rs-5302969/v2 and Middelanis et al. (2025[40]), Global Socio-economic Resilience to Natural Disasters, https://doi.org/10.1596/1813-9450-11129.

4 Policy stringency is defined here as the degree to which climate actions and policies prescribe, incentivize or enable GHG emissions mitigation.

3

Climate mitigation policies in Africa: Trends, gaps and regional patterns

The OECD Climate Actions and Policies Measurement Framework (CAPMF) makes it possible to systematically track progress on climate mitigation policies. This chapter applies the CAPMF to 28 African countries, contributing toward filling a long-standing data gap on the economic and environmental impacts of climate policies across the region.

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This chapter applies the OECD Climate Actions and Policies Measurement Framework (CAPMF) to 28 African countries to fill this gap in climate mitigation-related data. The CAPMF offers harmonized and comparable data across countries and time that support transparency, as well as quantitative assessments. Applying the CAPMF to the African continent provides the foundation for assessing countries' progress and can complement in-depth country reviews. This can culminate in evidence-based policy recommendations, supporting countries to avoid carbon lock-in and achieve their climate goals. Drawing on the CAPMF, the chapter presents climate mitigation action progress in Africa; key sectoral policy trends; the characteristics of Africa's policy instrument mix; and an analysis of climate mitigation action in Africa compared to other regions. The chapter ends with suggestions on how the data collected in this project can be used to develop more informed policies.

Africa faces a pivotal window of opportunity to shape its development trajectory through climate mitigation action. The continent accounts for only 4% of global energy-related greenhouse gas (GHG) emissions. With appropriate support, especially in technology transfer and finance, African nations can chart pathways that expand energy access, strengthen industrial competitiveness and improve public health, while avoiding the carbon lock-in observed in other regions. Carbon lock-in occurs when technological systems, institutions and behavioral patterns reinforce existing carbon-intensive development paths, creating persistent inertia not only in emissions trajectories but also in the associated costs – air pollution, fossil fuel import dependence, stranded asset risks and forgone opportunities in fast-growing clean energy markets (Seto et al., 2016[46]; IEA, 2023[47]).

Climate mitigation action is therefore a development strategy in its own right. It shapes energy access, urban infrastructure, industrial competitiveness and public health outcomes, while influencing emissions trajectories. Yet systematic assessments of the development and environmental effects of diverse climate policies across African countries remain limited (OECD, 2025[48]), largely due to a lack of comparable climate policy data. Such data are essential to assess the effects of mitigation efforts, aligning policy design with international best practices, and accelerating progress toward countries' climate and development goals. Comparable climate data also allow policymakers to track progress of climate mitigation action, enhance transparency and enable peer learning.

Existing empirical evidence shows that stronger climate mitigation action is positively associated with greater emissions reductions (Nachtigall et al., 2022[4]). In addition, climate policies can generate important development gains, such as improved air quality and health benefits (IPCC, 2022[48]). Understanding the scope and stringency of climate policies in African countries is therefore increasingly important for assessing how mitigation efforts can support sustainable development pathways while complementing near-term adaptation priorities.

To address this gap, this chapter applies the CAPMF to 28 African[3] countries. The CAPMF is an internationally harmonized climate mitigation policy database that covers the principal climate mitigation policies, including targets, market-based instruments, regulations and information instruments. It tracks the adoption and stringency of 272 policy variables grouped into 87 key policies across 96 countries (OECD, G20, accession economies and developing countries) from 1990 to 2024 (Box 4).

The CAPMF fills a critical data gap in climate policy by offering harmonized and comparable data across countries and over time. This supports transparency on policy developments, as well as quantitative assessments, including impact assessments and policy evaluation. Expanding the CAPMF to the African continent provides the foundation for assessing countries' progress and carrying out quantitative impact assessment. This can culminate in evidence-based policy recommendations, supporting countries to avoid carbon lock-in and achieve their climate goals. It can also complement in-depth country reviews such as the OECD Green Growth Policy Review of Egypt (OECD, 2024[49]).

Box 4. The OECD Climate Actions and Policies Measurement Framework

The OECD Climate Actions and Policies Measurement Framework (CAPMF) is an internationally harmonized climate mitigation policy database that covers the principal climate mitigation policies, including targets, and market-based and non-market-based instruments. Its primary objective is to track the evolution and stringency of governments' national climate policies over time.

The CAPMF 2025 edition tracks 272 policy variables, grouped into 87 policies, consistently from 1990 to 2024 (Figure 20). It comprises around 90% of policy instrument types listed in the last report of the Intergovernmental Panel on Climate Change (IPCC, 2022[50]). The CAPMF 2025 edition covers 96 countries and the EU-27 as a bloc, which generate 81% of global greenhouse gas (GHG) emissions, including from land use, land-use change and forestry. It covers all OECD Member countries except the United States, all G20 countries and all countries that account for more than 1% of global GHG emissions. The edition covers 28 countries in Africa, which jointly account for around 73% of African GHG emissions.

CAPMF data come from the OECD, the International Energy Agency, the International Transport Forum, the World Bank and other international data sources. Data for African countries have been collected by a joint effort of the Global Green Growth Institute, OECD Sahel and West Africa Club, and the World Bank, coordinated by the OECD.

The CAPMF measures countries' climate mitigation action in terms of both policy adoption and stringency. Climate policy action refers to combating climate change through a range of government interventions to mitigate GHG emissions. Policy stringency is defined as the degree to which policies incentivize or enable GHG emissions reductions. It is calculated as a relative concept by assigning a stringency score between 0 (not stringent) and 10 (very stringent) based on the in-sample distribution across all countries and years of the levels of each policy variable (e.g. tax rate, emissions limit values, government expenditure). The stringency score enables aggregation of climate mitigation action into meaningful categories (e.g. market-based instruments). To that end, it translates diverse units of policy variables (e.g. emissions limit values, tax rates, government expenditure) into a common unit. More information on the calculation of stringency and the CAPMF more broadly can be found in OECD (2025[51]).

The CAPMF needs to be interpreted carefully. As an indicator, it does not capture the full extent of government climate mitigation actions. Specifically, it does not yet cover all countries nor all policies, including some instruments that are especially important in the African context. For example, African countries and cities increasingly ban the sale of motorcycles with combustion engines, but the CAPMF does not cover these instruments. In addition, the CAPMF measures policies as they are in law but does not observe the extent to which national authorities enforce these policies. Finally, CAPMF results should be interpreted in a descriptive rather than a prescriptive way. CAPMF data describe the policy landscape and identify gaps without prescribing which policies countries should implement. Hence, results presented here are purely descriptive and do not imply any causal relationship between climate policies and emissions reductions. Despite these caveats, the CAPMF is a valuable database that provides insights into increasingly complex and varied climate policy approaches and trends across countries. Its foundational data for analytical work can culminate in evidence-based policy recommendations.

Figure 20 The policy scope of the CAPMF 2025 edition

Sector policies

Sector	Market-based instruments	Non-market-based instruments
Electricity	• Carbon pricing (ETS, carbon and fuel taxes, FFS reform) • RES support (FiT, auctions, RPS, tax credits, capital subsidies)	• Bans and phase outs of coal plants • Air pollution standards coal plants • Planning for renewables • PMR indicators • Grid rules for renewables
Transport	• Carbon pricing (+sub-national excise taxes) • Congestion charge • EV subsidies • Land value capture instruments	• Fuel economy standards (LDV, HDV, freight rail) • Energy labels • Public rail investment • Motorway speed limits • Bans and phase outs ICE: LDV+HDV • Bans of short-haul flights • PMR for rail and coach
Buildings	• Carbon pricing • Financing mechanisms for EE (e.g. preferential loans for retrofits) • Financial support for renewables	• MEPS appliances • Energy labels appliances + buildings • Building energy codes • Bans + phase outs of fossil heating • Regulation for renewables • Information on utility bills
Industry	• Carbon pricing • Financing mechanisms for EE • Tax credit CCUS	• MEPS industrial motors • Energy efficiency mandates • Labels for electric motors • Awareness for energy saving
AFOLU	• GHG emissions pricing • Fuel taxes for diesel	• Sustainable forest management • Protected areas • Food labels
Waste	• Carbon pricing • FiT for electricity from waste	• Landfill bans and phase outs • Repair labels

Cross-sectoral policies

Category	Policies
GHG emission targets	• Net-zero target (e.g. year, coverage, legal status) • NDC target (e.g. coverage of sectors and GHG) • Net-negative targets
Government investment	• Public expenditure in RD&D on low-carbon technologies (e.g energy efficiency, renewables) • Green public procurement rules
Fossil fuel production policies	• FFS reform for fossil fuel production • Bans and phase outs of fossil fuel extraction • Policies to reduce fugitive methane emissions (e.g. restriction on flaring)
Climate governance	• Independent climate advisory body • Environmental impact assessment
Climate-related financial policies	• Information (e.g. disclosure requirements) • Prudential policies (e.g. capital requirements) • Credit allocation • Issuance of green bonds

International policies

Category	Policies
International co-operation	• Participation in key international climate treaties • Participation in international climate initiatives (e.g. Climate and Clean Air Coalition) • Reducing emissions from international aviation and shipping (CORSIA + MARPOL VI) • Environmental provisions in trade agreements
International public finance	• Banning export credits for unabated coal plants • Banning public finance of fossil fuels abroad
GHG emissions data and reporting	• GHG emissions reporting and accounting (SEEA, GHG inventories) • Requirements to provide installation-level data • UNFCCC evaluation of Biennial (Update) Reports • Submission of key UNFCCC documents (e.g. National Communications)

Note: CCUS = carbon capture, usage and storage; CORSIA = Carbon Offsetting and Reduction Scheme for International Aviation; EE = energy efficiency; ETS = emissions trading system; EV = electric vehicle; FFS = fossil fuel subsidy; FiT = feed-in tariff; GHG = greenhouse gas; HDV = heavy-duty vehicle; ICE = internal combustion engine; LDV = light-duty vehicle; MARPOL VI = Marine Pollution Convention Annex VI; MEPS = minimum energy performance standards; NDC = Nationally Determined Contribution; PMR = Product market regulation; RD&D = research, development and deployment; RPS = renewable portfolio standard; SEEA = System of Environmental Economic Accounting; UNFCCC = United Nations Framework Convention on Climate Change.

Source: OECD (2025[52]), *The Climate Action Monitor 2025*, https://doi.org/10.1787/1819c631-en.

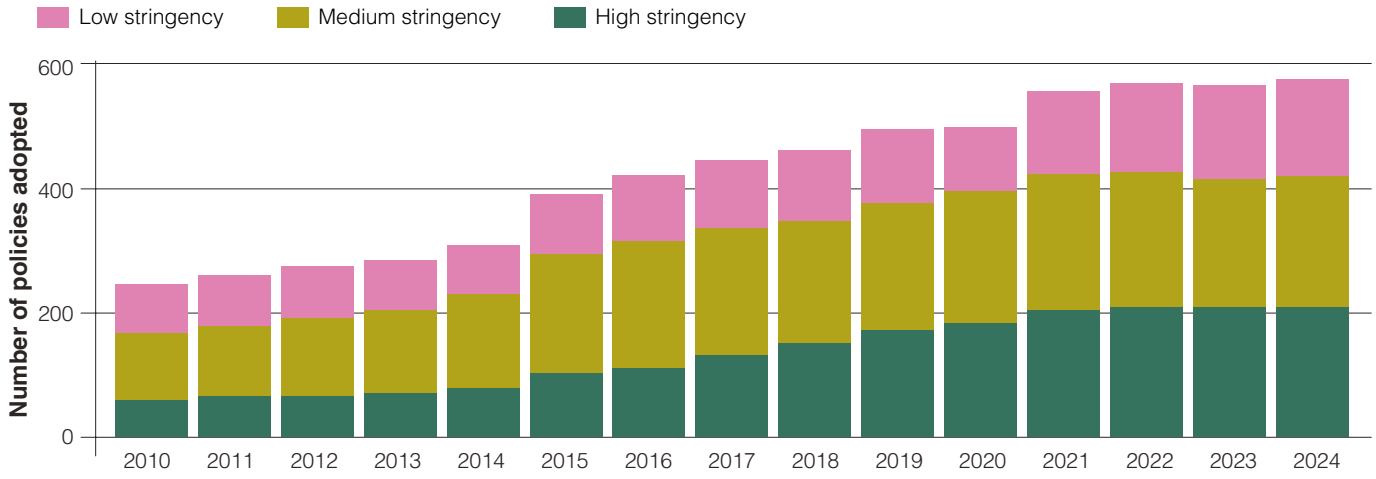
While impact assessment using the novel policy data is left for future work, this chapter presents key trends and characteristics in Africa's evolving policy landscape. Section 1 describes the general trends of policy adoption, policy stringency and a combination of both, termed as "climate mitigation action". Section 2 investigates the alignment of sectoral emissions profiles and policy effort. Section 3 describes the evolution of policy mixes to identify priority areas for tightening. Section 4 analyzes regional and sub-regional dynamics that may drive convergence, fragmentation or widening gaps between climate mitigation action. Finally, Section 5 concludes and outlines the next steps.

3.1 Climate mitigation action progress in Africa

Government climate mitigation action – as measured by the CAPMF – more than doubled between 2010 and 2024 in the sample of 28 African countries, reflecting both broader adoption of mitigation policies and gradual strengthening of existing policies (Figure 21, panel A). While the 28 African countries together had nearly 200 policies in place in 2010, this number increased to almost 600 in 2024. A particularly strong acceleration was observed between 2015 and 2021. This is consistent with the global momentum following the Paris Agreement, when many countries announced new frameworks and expanded their policy portfolios. Since 2021, growth of climate mitigation action in Africa has slowed significantly. Only marginal progress was recorded by 2024, a trend observed across the globe (OECD, 2025[52]).

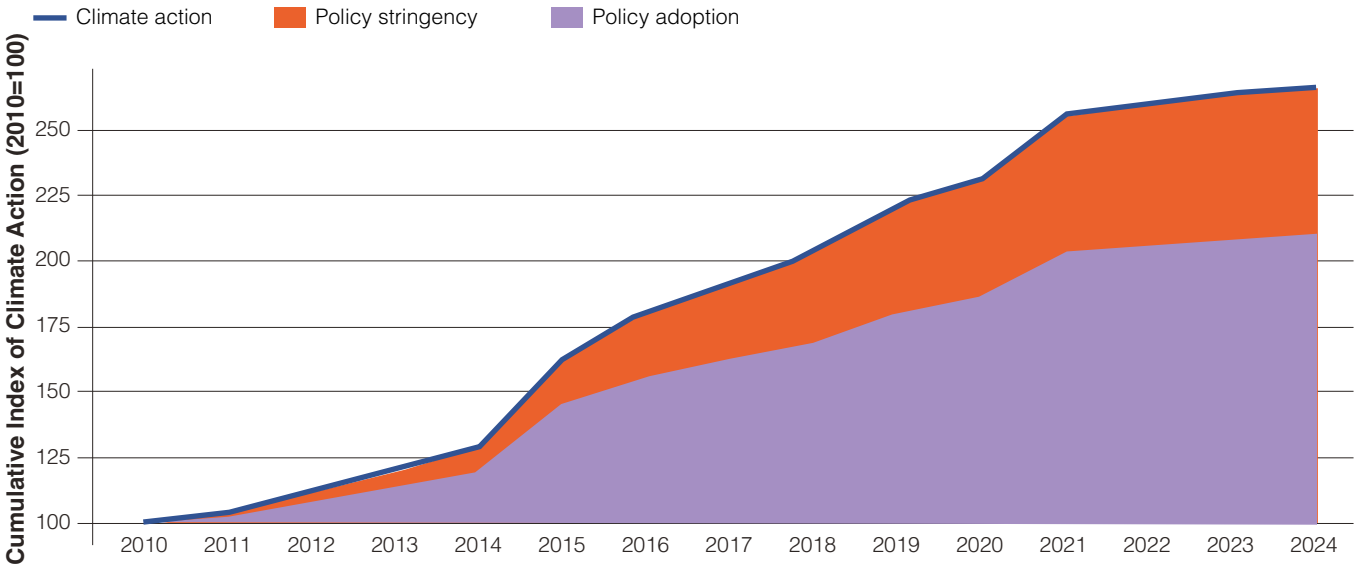
Most growth in climate mitigation action was driven by adopting new policies rather than strengthening existing ones (Figure 21, panel B). From 2010 to 2021, African governments steadily expanded the number of climate policies and started to strengthen existing ones (Figure 21, panel B). After 2021, both policy adoption and tightening mostly stagnated.

Figure 21 The rise and the stagnation of climate mitigation action are reflected in both policy adoption and policy stringency (A)



Note: (A): Bars show the total number of principal mitigation policies recorded in the CAPMF by stringency level (low/medium/high) for 2010-2024 across African countries. (B): Climate mitigation action in Africa, disaggregated by policy adoption and stringency. Stringency categories follow CAPMF thresholds; percentage labels refer to the share of total policies in that year.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

Figure 21 The rise and the stagnation of climate mitigation action are reflected in both policy adoption and policy stringency (B)



Note: (A): Bars show the total number of principal mitigation policies recorded in the CAPMF by stringency level (low/medium/high) for 2010-2024 across African countries. (B): Climate mitigation action in Africa, disaggregated by policy adoption and stringency. Stringency categories follow CAPMF thresholds; percentage labels refer to the share of total policies in that year.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

African countries still have multiple avenues to implement new policies or strengthen existing ones to avoid carbon lock-in. Over the past decade, African countries have struggled to move beyond initial adoption into consistent tightening. The stagnation after the COVID-19 pandemic suggests that political and fiscal pressures may have redirected attention from climate policy, or that institutional limits are undermining momentum in policy adoption and tightening. Climate mitigation in Africa continues to face multiple challenges. These include low disbursement ratios for climate finance and the need to better target policies and investments toward areas that deliver climate benefits while unlocking socio-economic priorities (Trisos et al., 2022[12]). For instance, sub-Saharan Africa receives only about 9% of mitigation investments directed to emerging market and developing economies outside the People's Republic of China[4]. Yet continued progress on both expanding the policy portfolio and strengthening existing policies is necessary to avoid carbon lock-in.

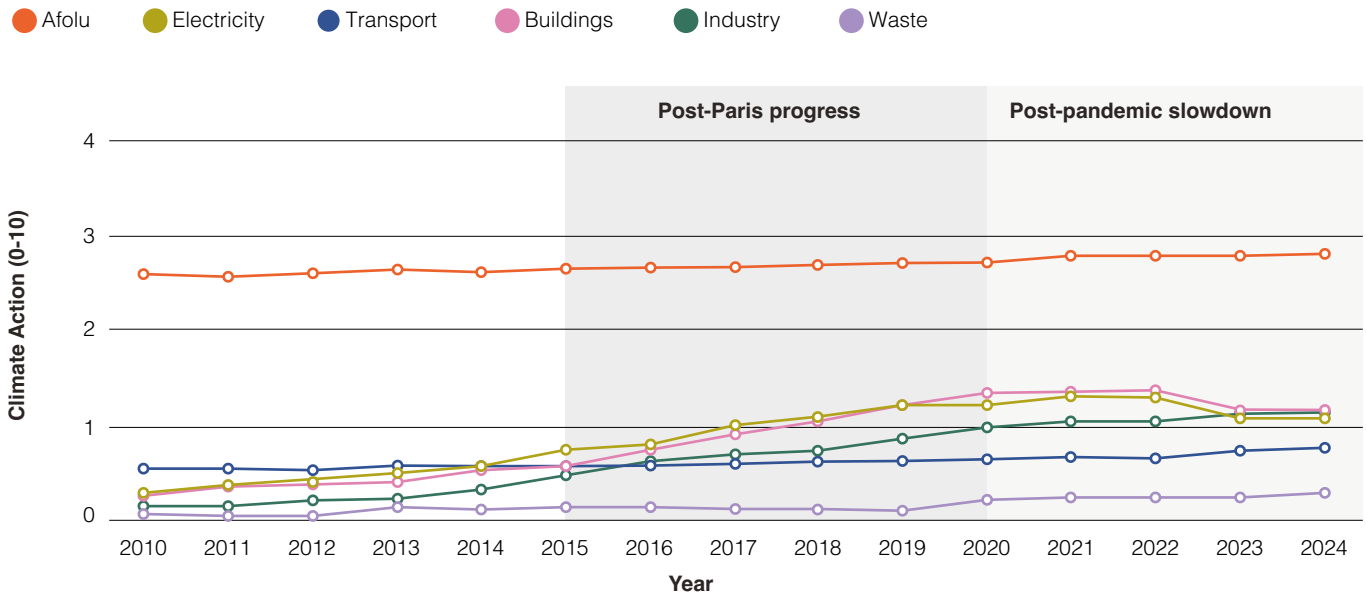
3.2 Key sectoral policy trends

Policy developments at the sectoral level reflect the overall trend of post-Paris acceleration followed by post-pandemic stagnation (Figure 22). Between 2015 and 2020, climate mitigation action increased across most sectors, with notable gains in buildings, electricity and industry. Meanwhile, agriculture, forestry and land use (AFOLU), transport and waste experienced modest progress. Since 2020, progress has slowed or reversed in some sectors: electricity and buildings show slight declines, transport has plateaued and only industry has continued to increase. Waste-related policies have increased slightly but remain at low levels relative to other sectors.

As the CAPMF uses different policy variables in each sector, climate-action levels are not directly comparable across sectors. For example, AFOLU's relatively high level of climate mitigation action mainly reflects the widespread adoption of sustainable forest management practices reported by many African countries rather than

a uniformly high level of climate mitigation action across the sector. Nevertheless, climate-action trends within individual sectors can be reliably used to uncover policy dynamics in these sectors. As such, this analysis clearly shows that the overall trend of post-pandemic stagnation is underpinned by a more differentiated policy dynamic at the sectoral level. Consequently, some sectors are strengthening their climate mitigation actions and others are stagnating.

Figure 22 The pace and extent of climate mitigation action differ significantly across sectors



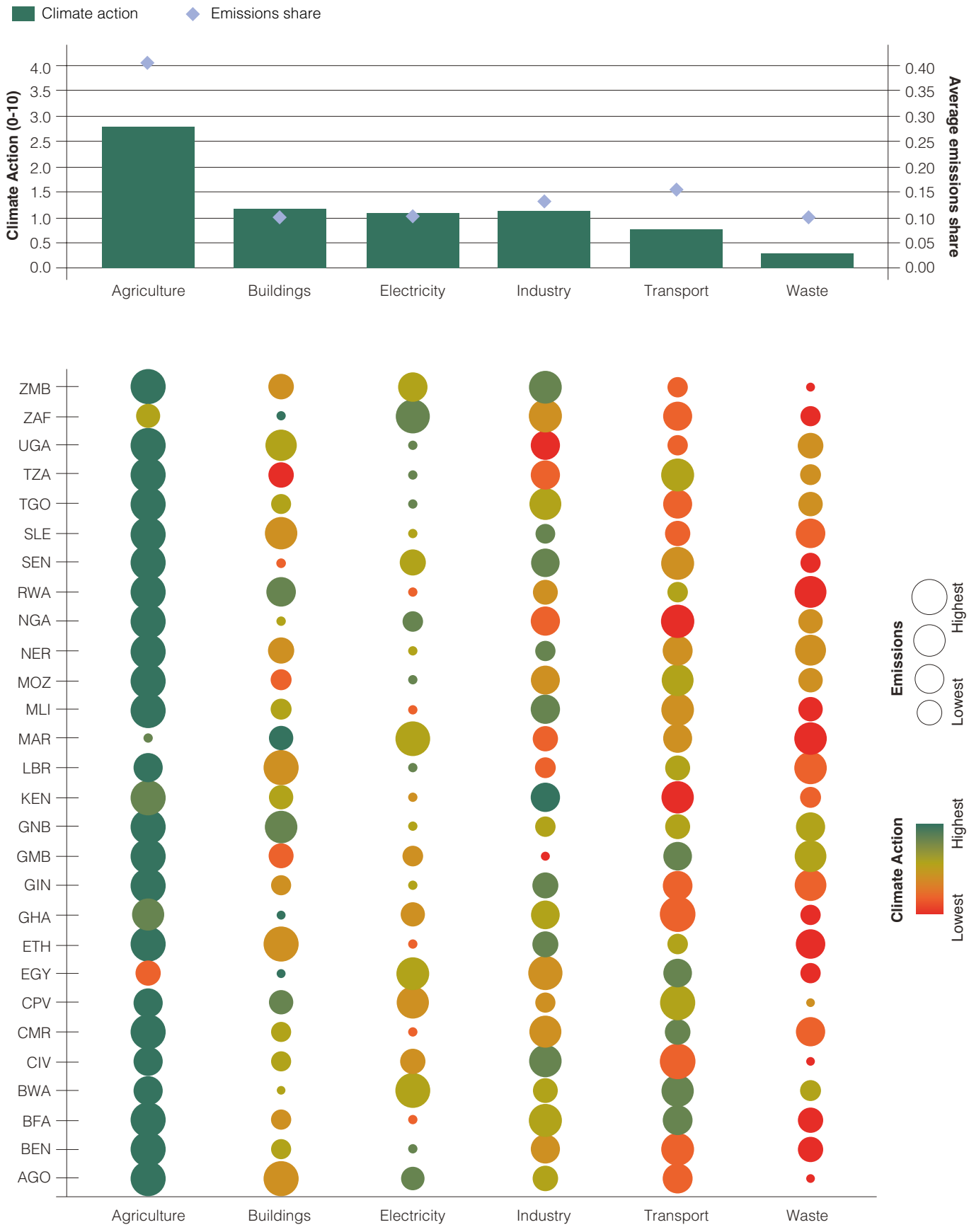
Note: Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10. Vertical markers indicate 2015 (Paris) and 2020 (pandemic). Sector series are simple averages across the countries.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

Overarching sectoral trends are driven by key policy developments of sector-specific policy instruments. For example, electricity-related policies – mainly auctions and feed-in tariffs (FiT) – have contributed to expand renewable capacity, yet their implementation remains limited (see also Figure 27 below). In transport, climate mitigation action relies mainly on fuel excise taxes, with little implementation of fuel-economy standards. In buildings, countries have increasingly introduced building codes, as well as minimum energy performance standards (MEPS) and labels for electric appliances. However, these tools are not yet widespread.

Climate mitigation action is not fully aligned with the emissions profile of African countries (Figure 23). Climate mitigation action tends to be well aligned for the agricultural sector, which has the strongest climate action and accounts for the largest share of emissions (although further strengthening remains possible). Electricity and industry both contribute moderately to overall emissions, while also seeing a moderate policy response, on average. In contrast, the transport and waste sectors account for a relatively large emissions share, but their climate mitigation action is lowest.

Country-level data confirm this pattern of misalignment. Most countries show large emissions footprints with little corresponding action in transport, waste and, to a lower extent, industry (Figure 23, panel B). Climate mitigation action and GHG emissions of countries are apparently misaligned across different sectors. This suggests possible avenues for more effective responses with more action required in transport and waste. The analysis here using the CAPMF can provide a first indication of a potential misalignment. However, more work is needed to assess countries' specific conditions and restrictions to provide tailored policy recommendations.

Figure 23 Climate mitigation action vs. emissions share is misaligned in countries' emissions profiles



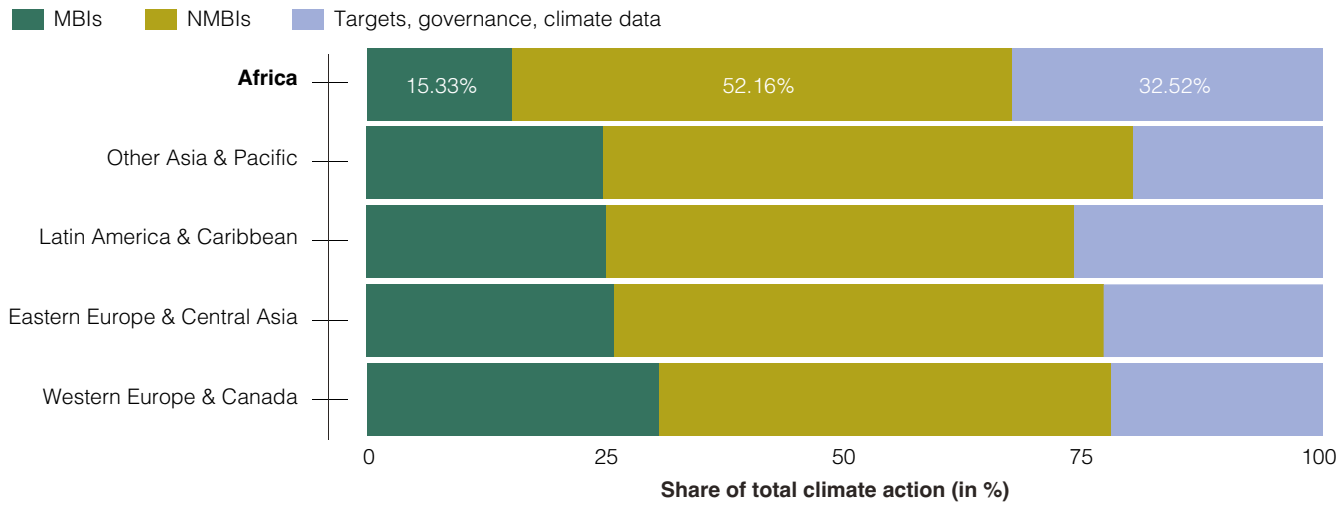
Note: (A): Bars show the climate-action index by sector; diamonds show the sector's average emissions share (right axis). Emissions shares are averaged across the selected countries for the latest available year; sector definitions follow the CAPMF. Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10. (B): Country-by-sector bubble plot: bubble size approximates sectoral emissions for each country; color scale maps climate-action index (green higher, red lower). Bubbles are intended for qualitative comparison within the sample. Emissions shares reflect the latest available EDGAR data, which may differ across countries and sectors.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

3.3 Characteristics of Africa's policy instrument mix

Africa has a unique policy approach to climate mitigation. Across world regions, Africa puts least emphasis on market-based instruments (MBIs), such as carbon pricing or environmentally beneficial subsidies, within its climate policy mix. MBIs represent only 15.3% of total climate mitigation action in Africa, which is much lower than in all other regions, including Asia and the Pacific, Latin America and the Caribbean, Eastern Europe and Central Asia, and Western Europe and Canada (Figure 24). According to the policy instrument mix in the region, African countries have a greater reliance on non-market-based instruments (NMBIs) such as regulation and standards.

MBIs and NMBIs have complementary strengths and weaknesses. While both MBIs and NMBIs have been proven to reduce emissions (Stechemesser et al., 2024[53]; OECD, 2025[54]), MBIs usually do so at lower cost. In contrast, NMBIs offer regulatory certainty through clear measures like bans and standards. Together, MBIs and NMBIs create a cohesive policy mix to reduce emissions.

Figure 24 The use of market-based instruments is limited in Africa

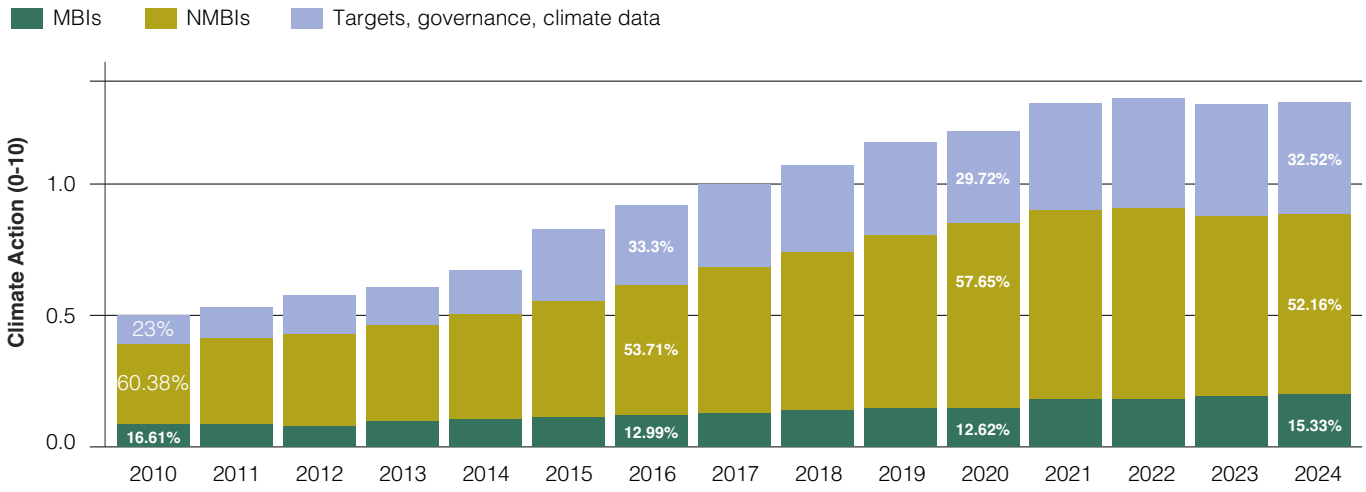


Note: Regional composition of the policy mix (latest year): shares of MBIs, NMBIs and targets/governance/climate data (sum = 100%). Africa values reflect the selected-country sample. MBIs = market-based instruments; NMBIs = non-market-based-instruments.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

Over time, climate mitigation action in Africa has expanded mainly through NMBIs and policies related to targets and governance (Figure 25). Much of this growth has been driven by measures like performance standards, energy-efficiency mandates, Nationally Determined Contributions (NDCs) and net-zero targets, and policies related to international coordination (Figure 26). In fact, African climate mitigation action related to international co-ordination, including participation in key international climate initiatives such as the Climate and Clean Air Coalition, is higher than in other non-OECD Member countries.

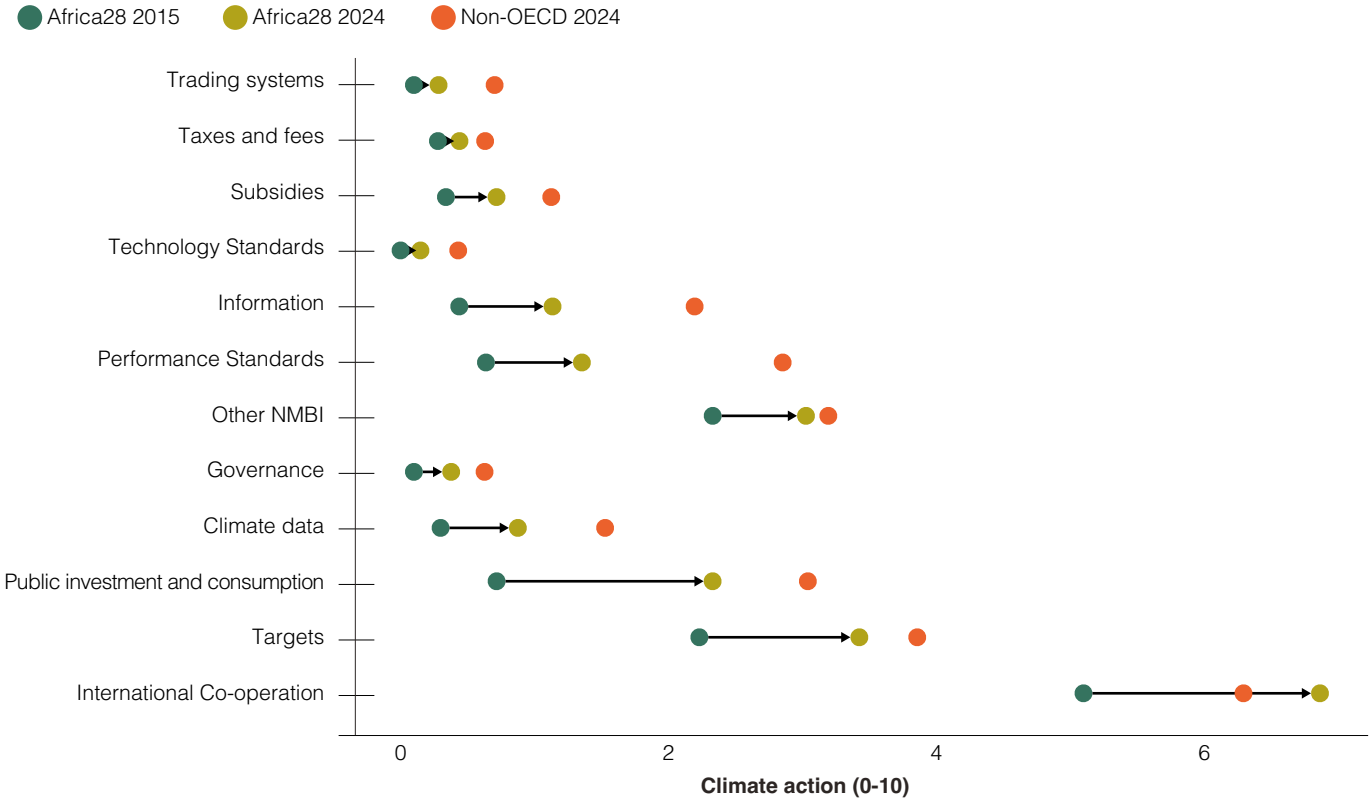
Targets and NMBIs are usually less institutionally demanding than MBIs such as carbon pricing and easier to integrate into development agendas. African countries may lack capacity to administer complex MBIs such as an emissions trading system (ETS) (Narassimhan et al., 2018[55]). This could help explain why NMBIs and targets expanded quickly while MBIs remained largely stagnant, and their relative importance declined.

Figure 25 Climate mitigation action has been mostly driven by non-market-based instruments



Note: Climate mitigation action by policy instrument (MBIs, NMBIs, targets/governance/climate data), 2010-2024. Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10. Classification follows CAPMF taxonomy. MBIs = market-based instruments; NMBIs = non-market-based-instruments.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

Figure 26 The growth of climate mitigation action across policy instrument types varies substantially

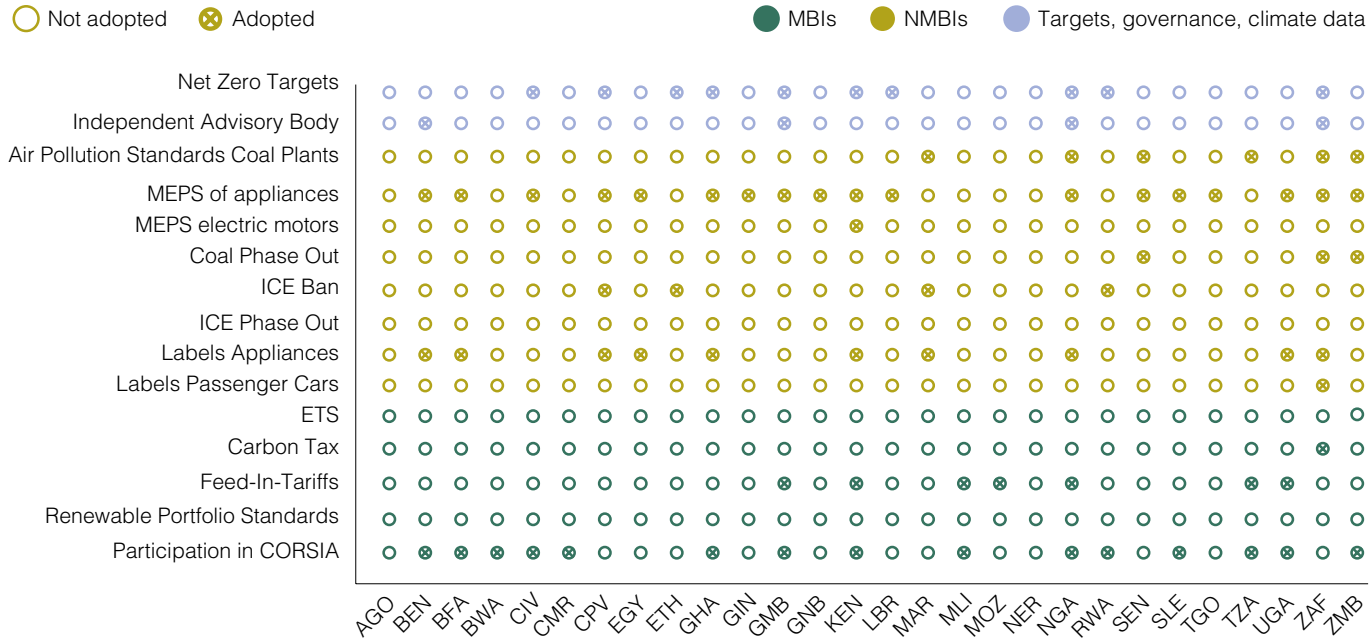


Note: Africa 2015-2024 change by instrument type (arrows) shown against Non-OECD 2024 level (dot). Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10. Instrument types follow CAPMF taxonomy. MBIs = market-based instruments; NMBIs = non-market-based-instruments.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

African countries still have many options to expand climate mitigation action (Figure 27). Net-zero targets have become more widespread with 10 of the 28 countries having one. Most countries have introduced some NMBIs such as MEPS or labels for appliances. Many African countries also have FiTs to support renewables in place and participate in CORSIA – the international aviation ETS – but coverage for most other instruments remains limited. In particular, none of the countries has adopted an ETS or uses renewable portfolio standards to support renewable electricity.

Policy adoption at the country level is uneven. Angola, for example, has not adopted any major mitigation instrument, while Nigeria has adopted seven: CORSIA participation; FiTs; appliance labels; MEPS of appliances; air pollution standards in coal plants; an independent advisory body; and net-zero targets. However, Nigeria still lacks pricing or auction mechanisms. South Africa stands out as the only country with a carbon tax, alongside a broader set of regulatory policies. A few countries have also introduced early regulatory steps, such as Ethiopia's ban on imports of internal combustion engine vehicles from 2025, much earlier than all OECD Members. Overall, this heterogeneity illustrates that regional averages mask differences in national portfolios and that African countries still have many instruments available – in particular MBIs – to avoid locking in carbon-intense developing pathways.

Figure 27 African countries still have many options to expand climate mitigation action



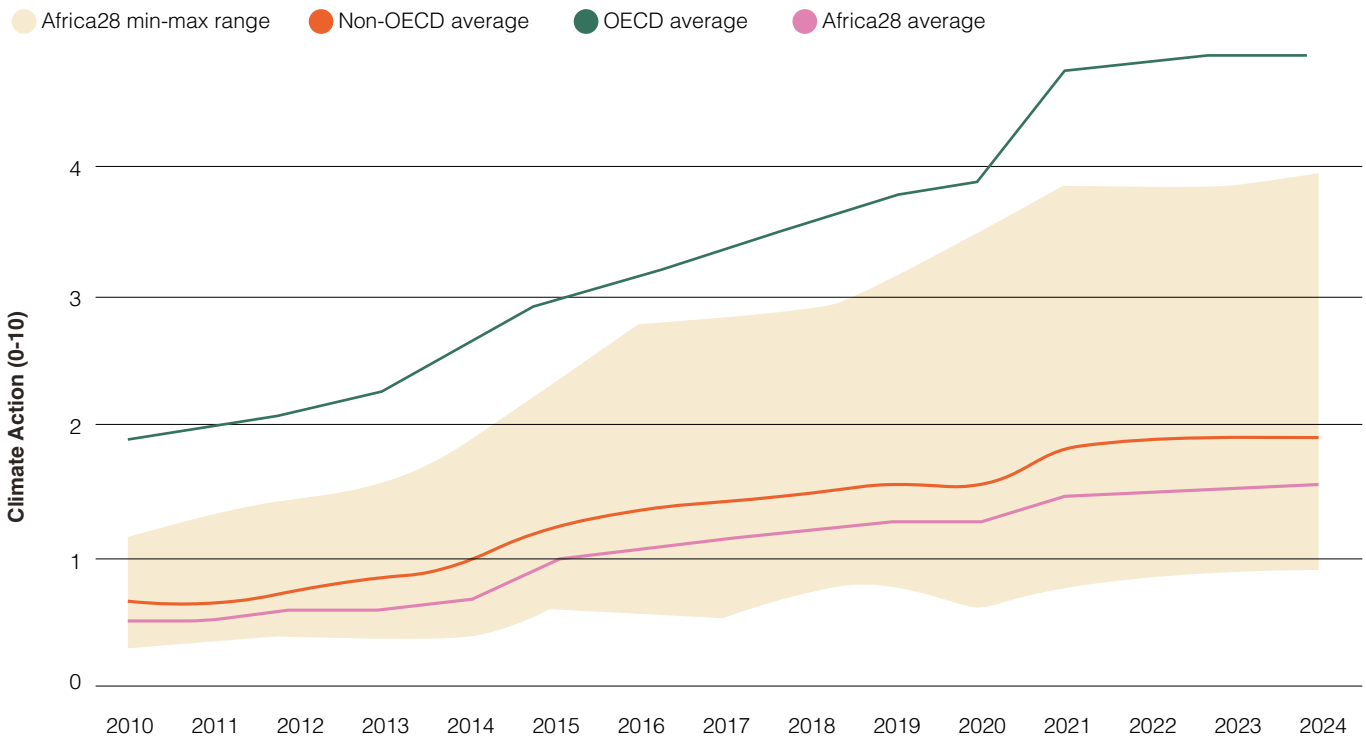
Note: CORSIA = Carbon Offsetting and Reduction Scheme for International Aviation; ETS = emissions trading system; ICE = internal combustion engine; MBIs = market-based instruments; MEPS = minimum energy performance standards; NMBIs = non-market-based instruments. Country–policy adoption matrix for MBIs, NMBIs, targets/governance/climate data, phase-out/ban items and CORSIA participation: adopted vs. not adopted.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

3.4 Climate mitigation action in Africa increased steadily compared to other regions

Between 2010 and 2024, climate mitigation action in Africa increased steadily, with an acceleration following the Paris Agreement and a marked slowdown after 2021 (Figure 28). Growth in climate mitigation action varied considerably within Africa. Some countries showed strong progress and others only marginal advances. This contrast can be seen in the shaded beige area of Figure 28, which represents the lowest and highest climate-action levels across African countries.

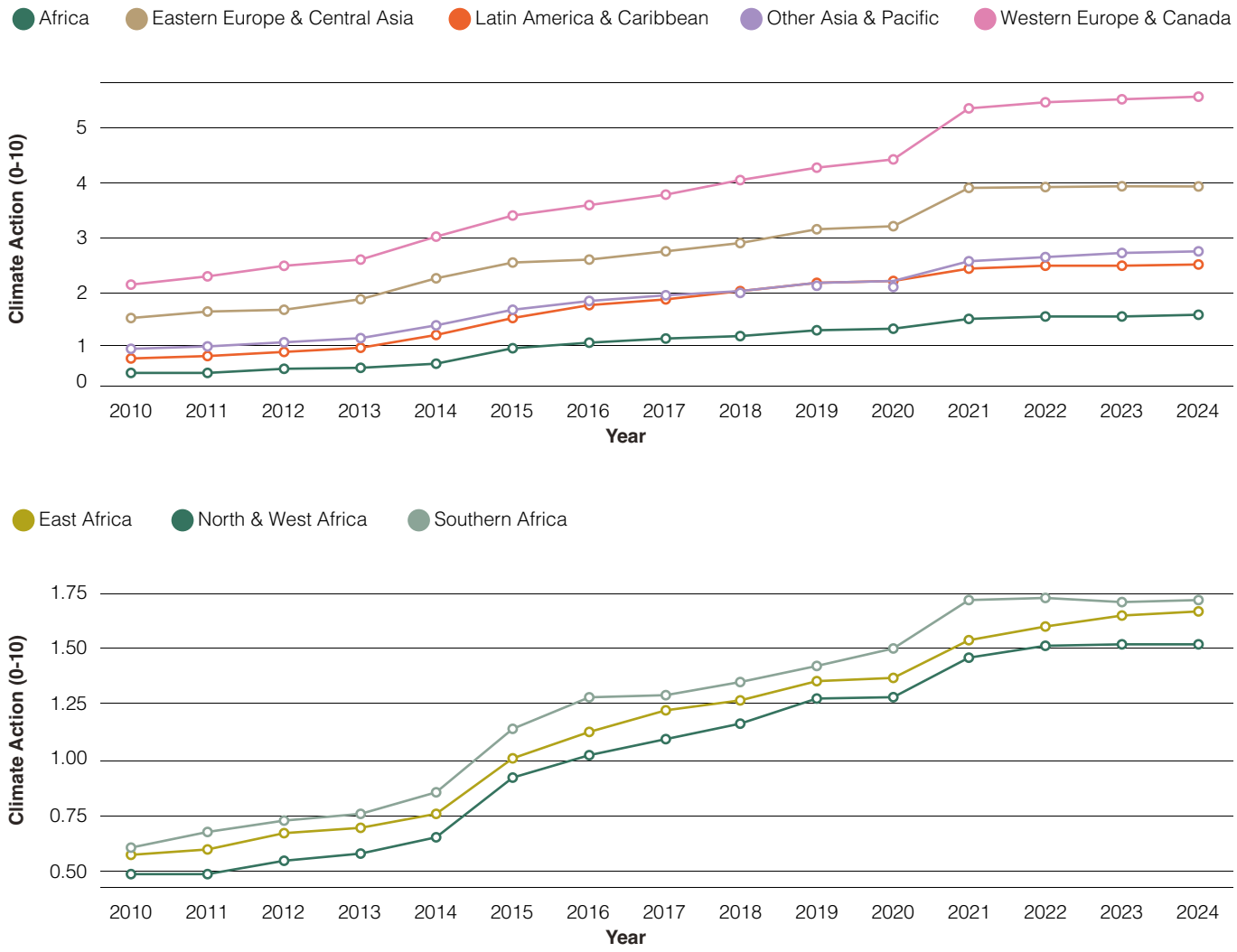
In addition, climate mitigation action grew at a smaller pace than that of OECD Members and non-OECD countries. This led to an increasingly widening gap between Africa and other country groups such as Western Europe and Canada, and Eastern Europe and Central Asia (Figure 29, panel A). However, African countries experienced one of the highest growth rates of climate mitigation action across all country groups, although from a lower level.

Figure 28 Climate mitigation action in selected African countries has increased but plateaued from 2021



Note: Africa average is the simple average across the 28 African countries; the OECD average includes all OECD Members but the United States. Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

Figure 29 Evolution of climate mitigation action across world regions (A) and African sub-regions (B)

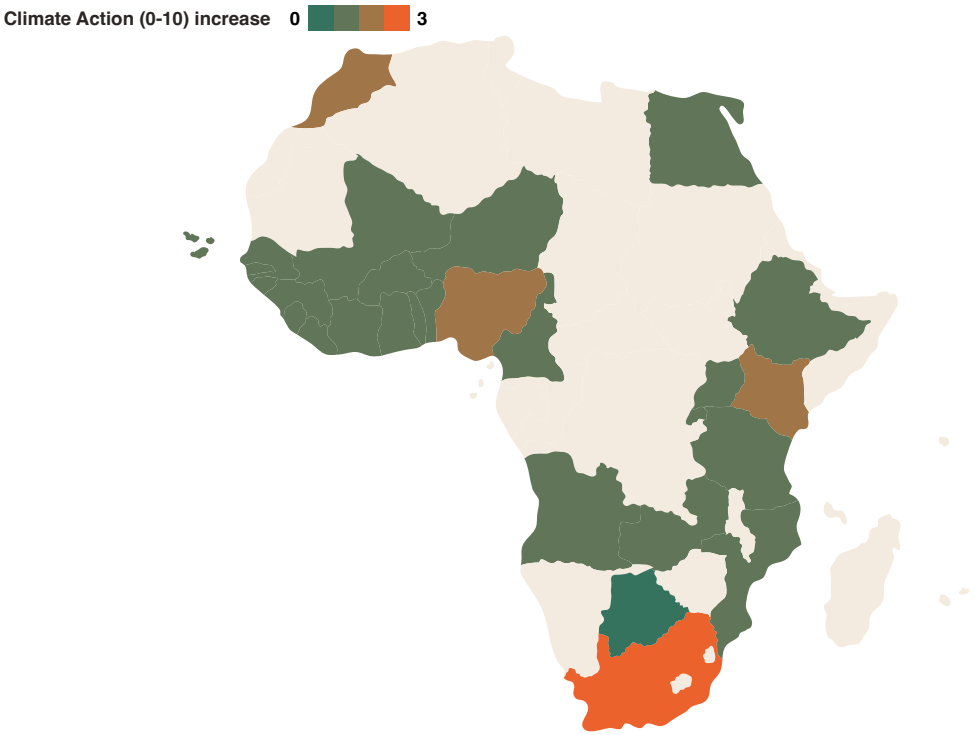


Note: Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10. Regional climate-action index (0-10) for all considered regions, 2010-2024. Series are simple averages across the countries in each region as defined in the CAPMF.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

Within Africa, Southern Africa has shown the strongest growth in climate mitigation action over the period, followed by East Africa, and North Africa has shown the strongest growth in climate mitigation action over the period, followed by East Africa, and North Africa and West Africa (Figure 29, panel B). The slowdown after 2021 is evident in Southern Africa, as well as in North Africa and West Africa. For its part, East Africa expanded climate mitigation action beyond that point, one of the few regions globally to do so. At the country level, several nations emerged as regional leaders in climate mitigation action, including South Africa in Southern Africa; Kenya in East Africa; and Nigeria alongside, to a lesser extent, Morocco and Egypt in North Africa and West Africa (Figure 30). These countries demonstrate that accelerating climate mitigation action can be successfully pursued, offering valuable examples that can inspire others.

Figure 30 Growth of climate mitigation action varies significantly across countries

Increase in climate action: 2010-2024



Note: Climate mitigation action is measured as a combination of policy adoption and policy stringency on a scale from 0-10. This graph shows the increase of climate action between 2010 and 2024.
Source: Based on data from OECD, IEA, ITF, World Bank, GGGI and others using the methodology of Nachtigall et al. (2022[4]).

3.5 Summary and next steps

This analysis has shown that climate mitigation action as measured by the CAPMF in Africa rose steadily after the Paris Agreement. The increase was driven mainly by adoption of new policies and – to a lower extent – strengthening of existing ones, especially in buildings, electricity and industry through NMBIs like regulations and information tools. While institutional frameworks improved, MBIs such as carbon pricing and renewable subsidies remain rare, with fuel excise taxes as the main exception. Progress varies across regions, with East Africa leading, followed by Southern Africa, North Africa and West Africa. Countries like Kenya, Nigeria and South Africa emerged as frontrunners.

Momentum is also building in the forest sector, where results-based carbon mechanisms are translating climate mitigation action into tangible development returns. Côte d'Ivoire received its first carbon payment under REDD+ in 2024, and broader policy work through the Forest Carbon Partnership Facility has supported REDD+ readiness and implementation across African countries (World Bank Group, 2024[56]). This foundation contributed to the recent approval of the Congo Basin forest multi-country program under the Global Challenge Programs Forest framework, with potential future engagement in the Upper Guinea Forest region – initiatives that protect forest

ecosystems while generating jobs and new revenue streams for participating countries (World Bank Group, 2026[57]).

The analysis also showed that all African countries still have considerable opportunities to expand climate mitigation action by adopting new policies or strengthening existing ones. African countries need to adopt and scale a core set of proven mitigation tools from regulatory standards to carbon pricing and targeted sectoral policies to avoid locking in carbon-intensive development patterns. The central priority is to establish policies that directly drive emissions reductions and guide sustainable, low-carbon growth. These demands strengthened frameworks, broader policy coverage, consistent compliance and credible enforcement embedded within national institutions. Without these systemic shifts, Africa risks being locked out of fast-growing green markets, bearing avoidable health and economic costs from carbon-intensive pathways, and falling short of both its development ambitions and the urgency of the global climate challenge.

This analysis is a first step in describing the policy landscape and key policy trends in Africa. As such, more efforts are needed to guide policymakers in their quest to avoid carbon-intense development patterns, deliver on emissions targets and contribute to sustainable development. The trends and data collected in this project can be used in multiple ways to better inform policies. First, they enable robust analytical work that can culminate in tangible, evidence-based policy recommendations (Box 5). Second, the data can be used to tailor these policy recommendations to the country level by identifying policy gaps or areas where policy stringency can be improved to maximize both development and environmental returns.

Robust policy evaluation for Africa can draw on existing work for other country groups. Evidence from OECD and G20 countries shows that design and strength of policies matter for emissions outcomes. Empirical studies find that higher policy stringency reduces emissions (Kruse et al., 2022[58]); a one-unit increase in the Environmental Policy Stringency (EPS) index is associated with reductions in CO_2 emissions in fossil-intensive sectors of about 4% after two years and 12% after a decade, although impacts vary across countries and sectors (Frohm et al., 2023[59]). Evidence from the 2022 edition of the CAPMF suggests that mitigation policies helped reduce emissions by about 12% between 2017 and 2022 based on a sample of 50 countries, mostly OECD Members (Nachtigall et al., 2024[60]). Policy density also predicts emissions trajectories, with broader coverage linked to slower growth in emissions (Nascimento and Höhne, 2023[60]). At the same time, research shows that adding instruments alone is less predictive of emissions cuts than increasing their stringency and ensuring diversity. Emissions fall most where both stringency is high and policy portfolios are broad-based (D'Arcangelo, Kruse and Pisu, 2024[61]).

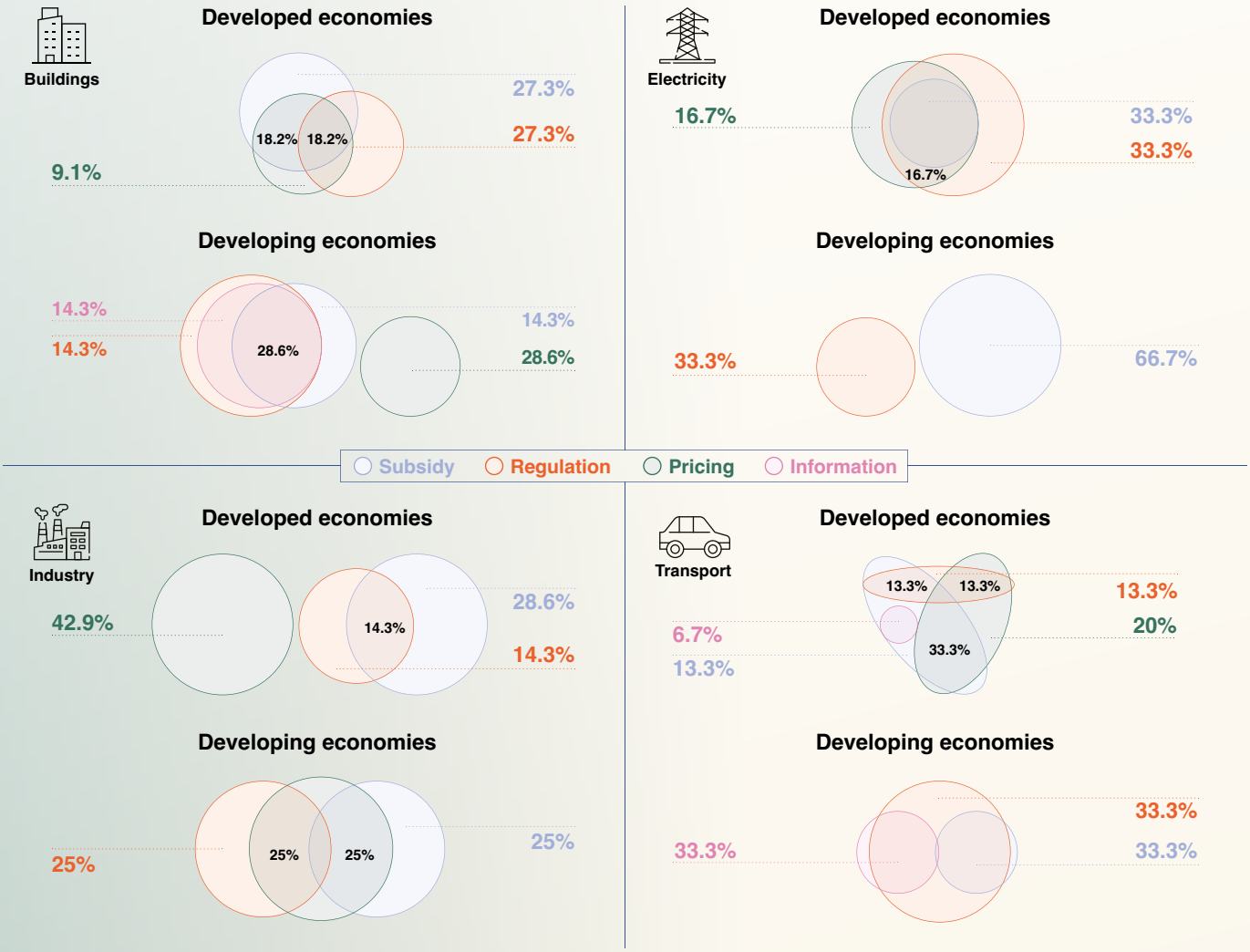
These efforts need to be complemented by improved climate policy data, including tailoring the policy scope to the African context and enhancing the geographical scope toward the entire continent. The general scarcity of climate data – and the acute lack of climate policy data – in Africa underscores the urgent need to intensify data collection efforts across the region. Robust foundational data are essential for generating evidence-based policy recommendations like the ones illustrated here. Without such data, policymakers lack the guidance needed to identify which policies reduce emissions effectively and to avoid locking in development pathways that carry heavy economic, social and environmental costs. Ultimately, the coming decade will shape how African economies compete, attract investment and deliver for their populations. Well-designed climate mitigation action is integral to that trajectory, and greater investment in data is critical to support mitigation that advances Africa's development priorities.

Box 5. Empirical evidence and effective policy interventions

Policymakers need to know which policies reduce emissions at scale to meet the temperature goals of the Paris Agreement. A study led by the Potsdam Institute for Climate Impact Research (PIK) combines data from the CAPMF with a machine-learning approach to provide the first global, systematic ***ex post*** evaluation that identifies policies and policy mixes that have led to significant emissions reductions or emissions breaks. Key messages include:

1. There is no one-size-fits-all approach. Effective policies and policy mixes vary significantly across country groups and sectors (Figure 31).
2. Policy mixes are more successful in reducing emissions than stand-alone policies. In all, 70% of emissions breaks can be attributed to a mix of policies, whereas only 30% were caused by stand-alone measures.
3. The complexity of effective policy mixes differs significantly across sectors. Policy mixes are more complex in the buildings and transport sectors, which are characterized by heterogeneous households subject to barriers (e.g. asymmetric information) rather than profit-maximizing firms.

Figure 31 Effective policy mixes across sectors and country groups



South Africa was the only African country covered in this study due to data availability constraints. The study identified three successful emissions breaks for South Africa, all of which were in the building sector. Major policies behind these emissions breaks include implementation of building energy codes and MEPS for key household appliances, combined with information instruments and – more recently – South Africa's carbon tax. The diversity of these policy instruments reiterates the importance of choosing the right policy mix.

Note: The diagram shows which combinations of policy types are effective. Each circle shows the share of successful interventions that involved a specific policy type or combination. The percentages indicate how often each policy set-up contributed to success.
Source: Based on Stechemesser et al. (2024[53]); CAPMF data available under https://oe.cd/dx/capmf.

Endnotes

1 UNEP (2024). United Nations Environment Programme. Emissions gap report 2024: "No more hot air … please!". Nairobi: United Nations Environment Program. https://www.unep.org/resources/emissions-gap-report-2024

2 Emissions-share indicators in the sector comparison are averages based on the latest available CAPMF data; coverage and definitions may vary by country and sector.

4

Priorities for climate policy action in Africa

The recommendations below call for closing data gaps on adaptation and resilience, taking pragmatic and sequenced approaches to policy implementation, mobilizing climate finance and seizing the opportunity of Africa's urbanization window.

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The evidence presented in this report makes a strong case for urgent, coordinated action. Africa faces some of the world's most severe climate risks, yet contributes only a small fraction of global emissions.The continent also stands at a pivotal moment in its development, with its energy systems still taking shape; its institutions still maturing; and most of its urban fabric yet to be constructed. The decisions taken in the coming decade will determine whether Africa charts a climate-resilient, low-carbon development path or replicates the costly, carbon-intensive patterns of earlier industrializers. Four priorities stand out.

Close the data gap on adaptation policy and climate resilience interventions

Effective policy requires a reliable picture of what interventions are in place, where momentum is building, what has worked and where critical gaps remain. On the mitigation side, extending the CAPMF to 28 African countries marks meaningful progress toward a consistent, comparable database. Adaptation action tracking, however, has not kept pace. Work to develop a standardized framework for classifying adaptation interventions across sectors and governance levels in a way that allows for cross-country comparison, or accountability is still in its infancy. While the Adaptation and Resilience Readiness Assessment offers a rigorous diagnostic approach, its coverage is limited to seven African countries and – in its present form – cannot support continent-wide benchmarking or trend analysis. Expanding this diagnostic, developing a formal adaptation policy taxonomy and strengthening subnational data collection are important and practical near-term steps. To guide this process, a structured assessment of Africa's climate adaptation data landscape would be important. This should map where standardized comparable data exist, where critical gaps remain, and what institutional and methodological investments are needed to fill them. Box 6 sets out how this effort connects to other global initiatives to close data gaps. In the near term, responsibility for expanding adaptation data systems lies primarily with national governments, supported by development partners and regional institutions. They should focus initially on scaling existing diagnostics and harmonizing data collection before attempting continent-wide benchmarking.

Box 6. Africa and the global agenda to address data gaps

The data limitations described in this report – particularly the absence of a harmonized methodology for tracking adaptation policies across countries – reflect a global challenge that the international statistical community is actively working to address. For example, ongoing global efforts, including the Global Goal on Adaptation and the global stocktake on adaptation under the Paris Agreement, underscore that benchmarking adaptation policies across countries remains an unresolved methodological challenge that scholars and policy practitioners around the world are working to advance.

A further example is the G20 Data Gaps Initiative (DGI), co-led by the International Monetary Fund (IMF) and the Financial Stability Board, launched in 2021 to strengthen global economic and financial statistics. Its third phase (DGI-3) includes seven climate-related recommendations spanning forward-looking physical and transition risk indicators, climate finance flows and the data infrastructure needed to support climate-resilient policy decisions.

For Africa, the significance of DGI-3 is twofold. First, it signals recognition at the highest levels of global economic governance that climate data gaps represent a systemic risk – not merely a technical inconvenience. Second, the tools and methodologies being developed under this initiative have real potential to benefit African policymakers, provided that coverage is actively extended beyond G20 economies. Ensuring Africa is included in these global efforts – rather than addressed as an afterthought – is itself an important policy priority.

The OECD forward-looking climate hazard indicators presented in Chapter 1 of this report offer one concrete example of progress on this agenda. Accepted by G20 economies as partially addressing DGI-3 Recommendation 5 on forward-looking physical risk indicators, these indicators are now being integrated into an IMF interactive tool for visualizing physical climate risks. This development could meaningfully improve the accessibility of climate risk information for African governments and financial institutions.

Pursue pragmatic, sequenced approaches to adaptation implementation

Improving adaptation outcomes requires clear sequencing, with early emphasis on building delivery capacity and institutional coordination, followed by gradual expansion in policy scope and ambition. Many African countries have made genuine progress in establishing adaptation strategies and institutional arrangements for building climate resilience. The harder challenge is implementation, and it is worth being clear-eyed about what that means in practice. For many countries in the region, the binding constraints are more fundamental than technical design issues: limited administrative capacity, overstretched line ministries, weak links between national planning and local delivery, and chronic underfunding of agencies responsible for climate policy action. In this context, the priority is not to layer more frameworks on top of what already exists. Rather, countries should identify practical entry points, such as a particular sector, institution or geographic area with existing capacity, and build outward from there. This approach is likely to generate more durable progress than pursuing reforms that outpace the institutional reality on the ground (Mealy, Ganslmeier and Hallegatte, 2025[1]). The goal is to build a track record of effective implementation; the repository of adaptation and resilience case studies in World Bank (2024[44]) is a useful reference. This should strengthen institutional confidence and create the foundation for progressively more ambitious action over time – driven by African governments and institutions on their own terms (Hallegatte et al., 2023[62]).

Mobilize and deploy climate finance more effectively

Access to adequate and well-targeted climate finance remains one of the most pressing constraints on climate mitigation action across the continent. Current climate finance flows meet only around a quarter of Africa's estimated annual climate needs, with just 18% of mitigation needs and 20% of adaptation needs covered (Meattle et al., 2024[63]). The distribution of finance flows is also highly skewed: the continent's ten most climate-vulnerable countries receive significantly less adaptation finance than other low-income countries, despite their greater exposure and lower capacity to respond (Meattle et al., 2024[63]). The challenge, however, runs deeper than these headline figures suggest. Many African countries face a difficult combination of high borrowing costs, limited fiscal space and debt sustainability pressures that constrain their ability to invest in climate mitigation action, even when external finance is, in principle, available. Simplifying access, improving the terms on which finance is offered, and ensuring that a far greater share reaches the most vulnerable countries are responsibilities that fall primarily on the international community. For African governments, priorities include strengthening public financial management systems; climate budget tagging processes; and planning frameworks that determine whether finance, once accessed, is deployed effectively and transparently. In practice, this implies a clear division of labor. International partners and multilateral development banks should focus on easing access and improving financing conditions, while national governments concentrate on strengthening absorptive capacity, project pipelines and implementation systems. Leveraging public finance to strategically de-risk investment, crowd in private capital and unlock job creation particularly in value chains – from renewable energy to sustainable agriculture and critical minerals – is also key.

Use the urbanization window to avoid carbon lock-in

Africa's rapid urbanization is simultaneously one of its greatest development opportunities and one of its most consequential climate decisions. The infrastructure, transport networks and building stock that cities put in place over the next two to three decades will shape energy demand, emissions trajectories and climate exposure for generations. African governments, regional bodies and city authorities have a rare opportunity to lock in climate resilience by prioritizing climate-conscious spatial planning, resilient infrastructure standards, and nature-based approaches to urban water and heat management before growth patterns become entrenched. In practice, this requires coordinated action across levels of government: national authorities setting enabling frameworks and standards, and subnational governments integrating climate considerations into land-use planning and infrastructure investment decisions. This offers a cost-effective path to avoiding expensive retrofitting challenges that have constrained climate mitigation action in more developed urban systems. However, this window of opportunity will not remain open indefinitely.

The priorities set out in this chapter are interconnected: better data make it possible to design more effective policies; strategic sequencing of interventions increases the probability of successful implementation; and well-structured finance makes it possible to scale up what works and ensure Africa's needed infrastructure is climate resilient. Underlying all priorities is a more fundamental point: the decisions Africa makes in the coming decade – on how its cities are built, how its economies are powered and how its most vulnerable populations are protected – will have consequences that extend far beyond the planning horizon. However, the continent is not starting from scratch. As this report has shown, climate mitigation action is advancing; adaptive systems are being built; and a growing number of countries are demonstrating that progress is possible even under significant constraints. The challenge is to move from isolated examples of good practice to systemic, continent-wide progress. The cost of getting this right is manageable; the cost of getting it wrong is not.

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