
# The Private Sector

## KEY MESSAGES

- The private sector in Africa generates two-thirds of the continent's economic output. Companies in Africa must prioritize adaptation to climate change to reduce risk, maintain productivity, and ensure the broader stability of the African economy.
- Innovative measures in adaptation can not only make companies and their supply chains more resilient, but they can also open new markets in areas like construction and nature-based solutions and new avenues for employment.
- Insurance organizations in Africa can act as a catalyst for the use of risk models and analytics to navigate best-suited climate adaptations. The financial services sector can also play a significant role by creating new products, monitoring climate risk and incentivizing adaptation actions.
- Corporates are also helping upstream and downstream stakeholders build resilience through knowledge-sharing and innovation. Private enterprises thus have a key role to play in helping

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communities and the broader economy adapt to the changing climate.

- To maximize these positive outcomes, collaboration across the private sector, public sector (such as by public–private partnerships) and financial and insurance sectors will be key.

**We know that the annual adaptation costs are expected to reach at least US$140 billion a year by 2030. And frankly, public finance is not going to be enough. We are going to need private finance."**

**Alok Sharma**
COP26 President

## CLIMATE RISKS TO CORPORATES IN SUB-SAHARAN AFRICA

Sub-Saharan Africa is facing a disproportionately high physical climate risk, which threatens to jeopardize hard-won development gains and disrupt citizens' lives and livelihoods.

By 2030, Africa may be home to more than 500 million people severely and moderately exposed to climate hazards in a 1.5°C warming scenario. If the world sees a 2°C increase in average temperature by 2050, the number of Africans exposed to one or more physical hazards related to climate could almost double from approximately 460 million people today to more than 900 million, an 80 percent increase over two decades.[1] Africa will become subject to intensifying climate hazards (such as extreme heat, extreme precipitation, drought, and decreased water supply), leading to severe climate impacts such as water shortages, reduced food production, loss of lives, biodiversity loss, and reduced economic growth.[2] It is estimated that close to an additional 40 million people in Africa will fall back into extreme poverty by 2030.[3]

Nevertheless, climate hazards manifest locally, meaning that risk profiles vary between and within African regions. West Africa, the Sahel, Central Africa, and North-Eastern Africa could continue to see increases in heavy precipitation and pluvial flooding. North Africa may experience water stress and decreases in mean precipitation. South and East Africa may experience an increase in average tropical cyclone wind speeds and associated heavy precipitation, while South-Western Africa may experience increases in aridity and agricultural and meteorological droughts.[4] Figure 1 shows that climate-exposed populations are mainly in West Africa, with pockets of high exposure in North and East Africa.

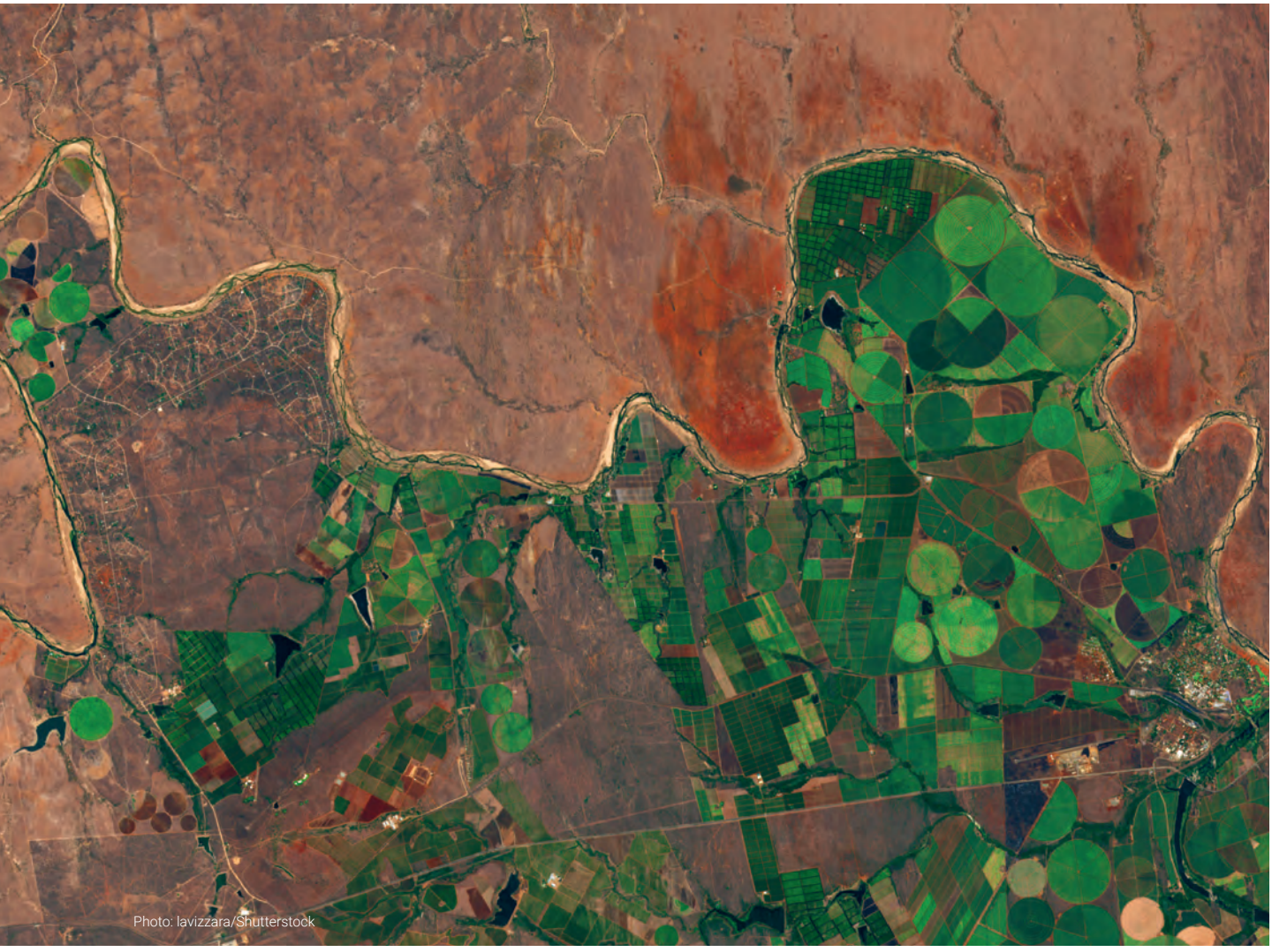

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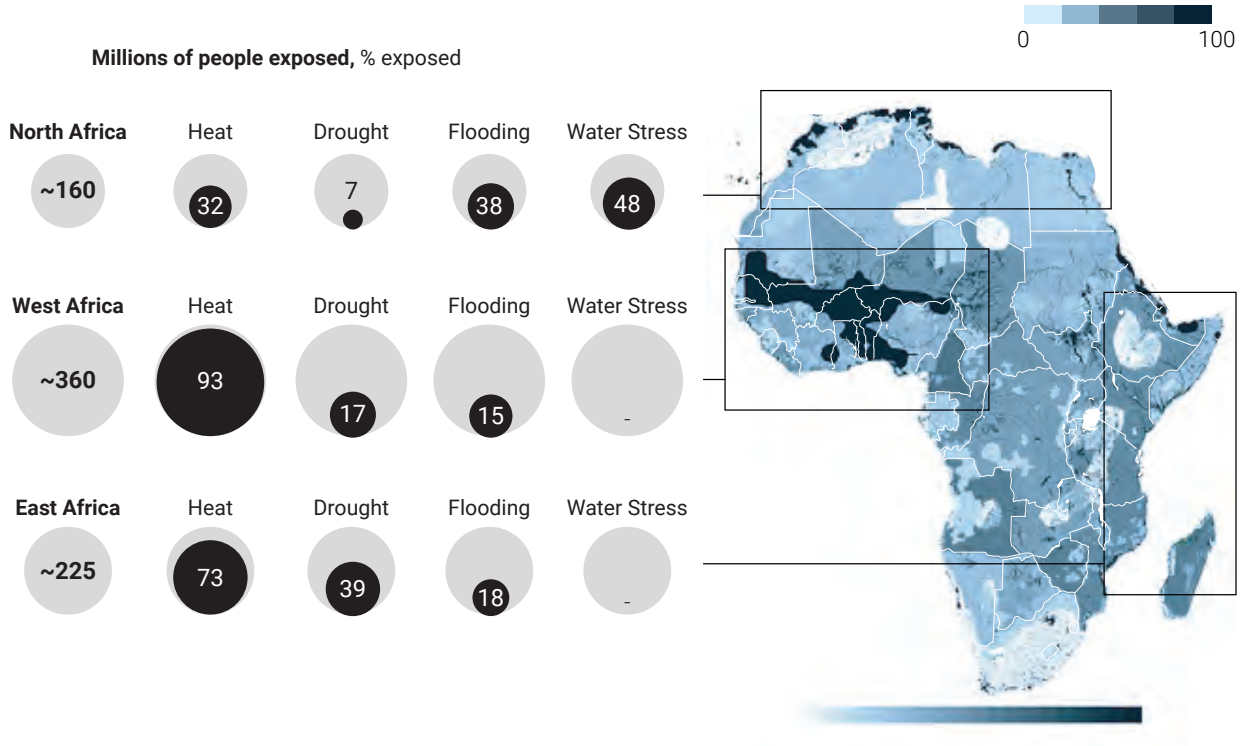
**Figure 1. People Exposed to Climate Hazards Under a 2°C Warming Scenario by 2050**




Source: "Green Africa: A growth and resilience agenda for the continent" by McKinsey & Company, based on IHS Markit; International Labour Organization (ILO); NASA Earth Exchange; National Center for Atmospheric Research Integrated Assessment Modeling; Socioeconomic Data and Applications Center; Woodwell Climate Research Center; World Resources Institute (WRI)

Different climate hazards are expected to translate into direct socioeconomic risks across five key systems. Climate risks to livability and workability, food systems, physical assets, infrastructure services, and natural capital leave certain value chains on the continent more vulnerable to impacts from climate change. These impacts across the five key systems capture the entire range of climate risks, as together these systems represent the collective impact of climate hazards on human beings, human-made physical assets, and the natural world.

**Livability and workability** refer to the ability of an area to sustain human life and activity and the capacity to engage in outdoor occupations. A large increase in heat and humidity increases the impact on the health and productivity of workers, reducing labor capacity because workers must take breaks to avoid heatstroke and because the body naturally limits its efforts to prevent overexertion. As discussed in the *State and Trends in Adaptation 2021* report, even if the world can stay within a 1.5°C warming by the end of the century, estimates suggest that in Western Africa, 4.6 percent of working hours will be lost, which equates to around nine million full-time jobs.

Many sectors, such as healthcare, construction, and agriculture, will likely experience significant impacts to the labor force's conditions of employment. African countries could see higher impacts on workability than richer nations around the world given the lower adaptation capacity to heatwaves currently. The agricultural sector plays a central role in the economy; in 2019, 52.9 percent of the total workforce was employed in agriculture across Sub-Saharan Africa.[5] The economic importance of this largely outdoor and labor-intensive process highlights how heat and humidity are likely to have substantial impacts on workability in agriculture across the continent.

**Food systems** include the production and distribution of agricultural products and the associated revenue and livelihoods. The agricultural sector (including crop production, livestock, fisheries, and aquaculture) plays a key role in Africa's food systems by supporting food security, nutrition, jobs, and incomes. Climate science suggests that

increased climate hazards are likely to cause an increase in global agricultural yield volatility along with a decrease in global crop productivity, leading to negative outcomes for food systems. Crop yields for important staples like maize and wheat are declining in the tropics as a result of climate change, and crop production could drop by 5 percent for every 1°C increase in temperature over historical values.[6] A 2020 UN report found that in Africa, staples such as rice and wheat could be among the hardest-hit crops, with estimated average yield losses of 12 percent and 21 percent, respectively, by 2050.[7] The report also estimated that by 2050, the overall agricultural yield in East Africa could be reduced by 8 percent. More urgently, the McKinsey Global Institute has estimated that by 2030, wheat farmers in Ethiopia will be 11 percent more likely than in 2020 to see a reduction in output of 10 percent or more in any given year.[8]

**Physical assets,** such as industrial plants and equipment, housing, and land, form an economic system that is vulnerable to climate hazards, such as flooding and wildfires. In addition to commercial and residential real estate, key sectors at risk include mining, energy, and manufacturing. The statistically expected damage to capital stock from riverine flooding could double by 2030 from today's levels, and quadruple globally in a 2°C warming world by 2050.[9] Real estate assets may depreciate over the next ten years due to increases in risk and job losses from climate hazards and could then affect habitability and economic growth.[10]

**Infrastructure services** refers to the network of assets that serves a community, such as utility grids (energy infrastructure), water treatment management and sewerage networks (water infrastructure), and roads, bridges, and railways (transportation infrastructure). Each infrastructure has differing vulnerability to climate hazards, including flooding, forest fires, hurricanes, and heat, and could be destroyed or severely impacted, leading to a decline in the services they provide or a rise in their cost. Climate hazards can lower the reliability of utility services such as energy and water; heat vulnerability or water scarcity can lead to the rationing of water supply; utilities located in flood-prone areas may experience water infrastructure and saltwater intrusion impacts, which reduce their efficiency and resilience; and high temperatures can overload power plants as energy demands from air conditioning increase. Power systems and other infrastructure services could also become less productive under very hot conditions, which in turn can have knock-on effects on other sectors. African countries' electricity supplies are also threatened by increased interannual variability and uncertainty in hydropower generation, especially with more frequent and more severe droughts.[11] Extreme precipitation, storms, and severe heatwaves could also destroy the existing electricity networks and grids, further disrupting the electricity supply.

Finally, **natural capital** refers to ecosystems, such as glaciers, forests, and oceans, which provide important resources and services to society. Changes in natural capital from climate hazards can disrupt key sectors (for example, tourism) that rely heavily on climatic patterns, such as seasonal shifts and weather conditions, and on the use of physical assets, land, and ecosystems. Research suggests that significant biome shifts are expected in Central and Southern Africa, which could affect the livelihoods of the communities that rely on tourism.[12] In Kenya, a 2019 study found that 54 of 844 wildlife species (6 percent) assessed in the Greater Mara Ecosystem and 101 of 793 species in the Maasai Mara National Reserve (13 percent) would no longer find the areas climatically suitable by 2050.[13]

While direct impacts from climate change are experienced more significantly in certain systems and value chains in Africa, cascading impacts across all systems can magnify vulnerabilities. Cascading impacts refers to the transmission of direct impacts across interconnected sectors and regions. These ripple effects can affect economic, financial, and social systems, and differ in scope—from a stranded asset impacting downstream parts of the supply chain to the destabilization of a country. According to the Stanford Environment Assessment Facility, a 2°C temperature rise by 2050[14] is likely to dramatically increase the proportion of climate-induced tensions from 6 percent to 13 percent of total armed conflicts.[15]

## Box 1. A Focus on Water Resilience

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African countries' water supplies vary seasonally and year by year. Projections of future precipitation are deeply uncertain, but variability is increasing, and extremes are increasingly common, with more frequent and severe droughts but also more floods.[16] Saltwater intrusion, which can be exacerbated by groundwater depletion, also poses growing concerns in coastal areas.

The availability and quality of water is crucial for drinking water, food systems, industrial processes, infrastructure services, and ecosystems. African countries' heavy reliance on rainfed agriculture and on hypdropower make water insecurity a particularly serious concern with climate change.[17]

Climate risks present increased cross-cutting hazards to many organizations reliant on water usage and may require heightened attention to and management of water stresses. Based on disclosures by more than 500 companies, CDP has estimated that water insecurity threatens US$425 billion in value, with about 40 percent of the risks anticipated within one to three years.[18] For example, in the mining sector in Africa, climate and nature impacts are already materializing in different forms; in particular, severe flooding and storms are disrupting mining sites in Burkina Faso and other West African countries.[19] The disruption of transportation routes due to flooding, complications in the environmental rehabilitation of mine sites, and direct competition and conflict with local communities (which may perceive water use in mining as a direct conflict with their own water rights and needs) are examples of the impacts of water stress on industrial operations.[20]

Africa's fast-growing population and expected increase in water resource unpredictability call for climate adaptation solutions for water resource management. Investing in better water management services is becoming ever more important for all actors impacted by some or all of the climate risks discussed above. For example, increased investment in water management and water reuse technologies, as well as water consumption conservation, can help the mining sector become more efficient and adapt to the unpredictability of droughts and drier temperatures across the region. In response, integrated water planning and management across sectors (such as energy, land, forest, ecosystems, and agriculture) could make water use more efficient and reduce environmental impacts. More water storage could also help when discharges are low. Physical protections (such as flood-prevention structures, better irrigation systems, upgraded canals, precision land leveling, and proper implementation and enforcement of building codes) and management tools (such as land-use planning laws and early-warning systems) are also needed to manage risk.[21]

## CLIMATE CHANGE IMPLICATIONS ON CASH FLOW AND GROWTH OF PRIVATE COMPANIES IN SUB-SAHARAN AFRICA

The private sector[22] in Africa currently generates two-thirds of the continent's investment, 75 percent of its economic output, and 90 percent of employment. Across multinationals and micro-, small and medium-sized enterprises (MSMEs), climate hazards are expected to increase the costs for private-sector actors by impacting assets and worker productivity and by disrupting operations and value chains. Revenue may also decrease due to changes in demand related to fluctuating population, income, and migration patterns. Finally, as increased costs and reduced revenues are expected to affect cash flow and company performance, unfavorable expected rates of return for investors may affect international investment attractiveness and thus the flow of investment into perceived high-risk countries.

Climate hazards are expected to translate into higher costs, ranging from asset restoration to disruptions to the supply chain. First, climate hazards are expected to translate into challenges for workers' wellbeing and safety, as well as higher costs tied to productivity reduction. As discussed earlier, heat stress will be a significant factor in worker productivity unless adaptation measures are implemented.

Second, heat stress, flooding and drought can impair the functionality of and accessibility to on-site infrastructure and capital, translating into higher costs for maintenance and repair and requiring investment in more efficient and resilient technology. For example, South Africa, Zambia, Malawi, Benin, Mozambique, and Kenya have the largest number of businesses reporting detrimental water-related impacts globally, which includes physical damage to property from flooding and extreme weather events.[23]

Third, climate hazards may impact upstream and downstream value chains and increase the procurement and distribution costs of companies. Grid inefficiencies and impacts to transport infrastructure driven by climate risks create disruptions that reduce the reliability of utility services and can increase operational and procurement costs. Similarly, climate hazards can disrupt upstream value chains and increase producers' off-site costs when key infrastructure and transport routes or distribution warehouses and services are damaged, inaccessible, or destroyed. For low- and middle-income countries, the World Bank has estimated that globally, disruptions to water, power, and transportation services cause losses of over US$150 billion every year.[24]

Climate hazards are expected to put pressure on revenues by altering the demand base of the private sector. An increasing number of companies have been considering the impact of climate change on their own operations as climate risks impact their revenues through customer base loss due to displacement, changes in income or supply-chain paralysis.[25] The World Bank projects that by 2050, climate change may be a driving force for over 100 million Africans to migrate within their countries, away from areas with lower water availability and crop productivity or rising sea level and storm

Photo: Jonathan Erasmus/iStock

surges.[26] One 2007 study in Namibia concluded that even under the best-case climate change scenario at the time, a quarter of the population would need to leave vulnerable sectors, such as agriculture, fisheries, and tourism, and find new livelihoods by 2050 (see "Insert: Migration and climate change" in this report for further details on projected levels in Africa due to climate change). As populations migrate, their demand for products may change in conjunction with their income shifts, offering the possibility for new market opportunities for private-sector actors in the relocation destination.

Additionally, climate change is expected to have an impact on the cost of financing and insurance, which may hamper the ability to fund growth. Over a third of the expected US$2.5 trillion increase in insurance premiums is likely to be driven by climate change.[27] As critical assets and infrastructure are damaged, cascading risks could magnify the economic damage and fiscal impact of climate-related disasters, potentially making affected companies less attractive recipients of investment. The negative effect of physical damage could be exacerbated by a subsequent decrease in funding for recovery and future economic growth, due to perceptions of heightened risk. For example, flooding is expected not only to damage properties but also to raise insurance costs, affect the property values of exposed capital, and in turn reduce property tax revenue for communities, which could hinder socio-developmental gains.

Rising climate extremes are also expected to reduce the availability or increase the price of insurance, increasing the risk of financial instability. In Africa, insurance penetration is already very limited. The insurance market was valued at US$68 billion in 2018, with 80 percent of premiums concentrated in South Africa, and much of the rest in just a few countries, such as Egypt, Morocco, Nigeria and Kenya, mainly involving large corporations.[28] Insurance premiums tend to be high for MSMEs, which in turn struggle to assess and provide insights into residual risk exposure and struggle to lower uncertainty.[29]

**We happy to be working with the GCA and signing a Memorandum of Understanding, where they'll provide technical assistance to help us source and originate debt. And we'll be working with several Development Finance Institutions and climate funds to provide risk mitigation for the private sector investors, including sovereign wealth funds, pension funds, insurance companies and asset managers."**

**Zainab Faisal Kufaishi**
Head of Middle East and Africa, and Senior Executive Officer, Invesco

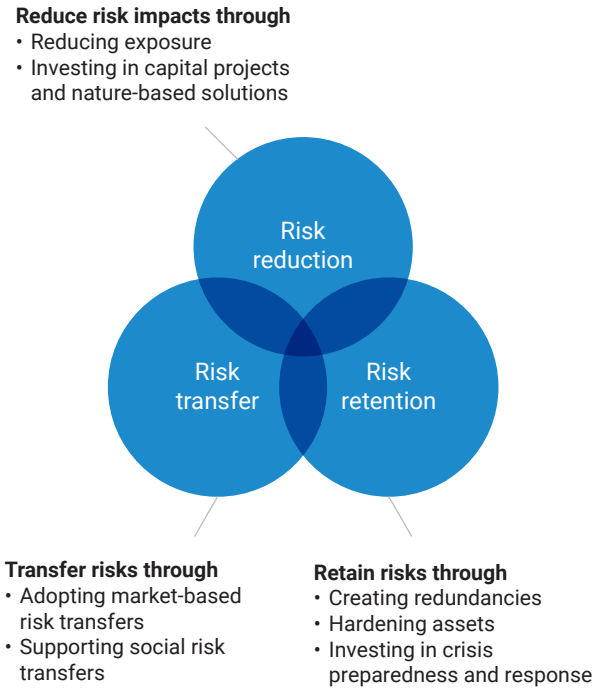
## ADAPTATION ACTION BY CORPORATES TO REDUCE AND MANAGE CLIMATE RISKS

Climate-risk assessments can help companies target their risk mitigation countermeasures. Leveraging different climate and socioeconomic scenarios, such as the reports by the Intergovernmental Panel on Climate Change, companies can understand their exposure to hazard changes in frequency and intensity. Those must then be translated into direct and cascading operational, financial, and social impacts on companies. However, limitations and lack of granularity in climate and socioeconomic data can be salient bottlenecks in risk quantification. These limitations can range from sparse time series to complex circulation patterns, lack of locally relevant damage functions to assess vulnerability, or lack of asset values across the supply chain.

To overcome this, some uncertainty handling techniques can be applied, such as using downscaling processes with bias correction to match the observed historical patterns of climate change, or using ensemble means to attenuate model error across individual models. Collaboration across stakeholders can also improve data quality and availability. Some large companies have developed knowledge networks with academia, scientists, and government research institutions to address this challenge, and could share their findings with peers to enhance sectoral capacity building. The expansion of climate-risk information such as forecasts, economic analyses and identifying trends enables better climate adaptation for targeted approaches. The opportunity for insurance organizations in Africa to act as a catalyst for the use of risk models and analytics to navigate best-suited climate adaptations is clear through their role in identifying risks associated with the assets and activities of organizations. Firms across the continent are then likely to benefit from investing in building knowledge of their contextual climate risks and will seek to gain a competitive advantage in being able to navigate future investments and better adapt to hazards.[30]

A range of adaptation measures to reduce, retain, or transfer climate-related risks can help private-sector companies navigate their exposure to climate change.

**Figure 2. Measures to Negotiate Climate-Related Risks**




Source: McKinsey Global Institute staff

Photo: Mikkel Ostergaard/Panos Pictures

When it comes to **risk reduction**, companies can reduce their exposure by relocating their sites or supplies away from high-risk areas. In addition, private-sector actors can invest in projects that strengthen the resilience of their capital and infrastructure against extreme weather and climate conditions. For example, the OCP Group, a global fertilizer producer based in Morocco, has collaborated with public authorities to invest in desalination stations and wastewater recycling plants to reduce water pollution and address water stress pressures, thereby lowering the risk of water scarcity for its production system and for the livelihoods of communities in North Africa.[31] The OCP Group has also partnered with research centers to introduce new higher-yielding varieties of quinoa to farmers, helping to reduce food insecurities caused by drought and water stress.

Further, the private sector has additional opportunities to capture co-benefits and reduce its exposure to climate risks by investing in nature-based solutions (NBS). While it can be costly and take a long time to set up and generate substantial income, preserving ecosystems by leveraging Africa's vast NBS potential can generate added benefits such as an increase in biodiversity, access to the carbon credits market, and support for the security of local communities.

For example, an NBS initiative called the Great Green Wall has evolved from the idea of a 7,000 km belt of trees planted across the width of Africa to a comprehensive vision for restoring 100 million hectares of degraded land. This project builds resilient land-use systems with the capacity to adapt to uncertainty and climatic extremes and to enhance the livelihoods of local people and provide long-term solutions for improving environmental and socioeconomic conditions in the zone. The Great Green Wall Initiative can safeguard roads in African cities by improving stormwater management, and at the same time reduce the need for and costs of engineered solutions such as stormwater drains. It has the potential to create 10 million environmentally oriented jobs and improve the productivity and livelihoods of people, while at the same time restoring ecosystems in countries such as Mali, Niger and Senegal.

Regarding **risk retention**, companies can take steps to create redundancies, harden assets, and invest

in emergency response. Creating redundancies mainly includes developing distributed and diversified networks to avoid being reliant on a sole origination point for supplies. Hardening assets means fortifying them against climate hazards or developing new products and services that can sustain chronic and physical hazards. For example, in the aftermath of Cyclone Idai, 14Trees was founded as a joint venture between private company Holcim and the UK's development finance institution, British International Investment. By deploying innovative construction technology such as 3D printing, 14Trees aims at accelerating the provision of affordable housing and infrastructure in Africa, especially in the aftermath of natural catastrophes. Just as importantly, with its record speed of construction and optimized material use, such technology can reduce the carbon footprint for building new homes by up to 70 percent, and sustains skilled job creation with the hiring and development of local experts, from 3D machine operators to materials specialists working with local builders for carpentry, roofing and painting.[32]

Finally, investing in crisis preparedness and response includes developing and boosting the adoption of early-warning systems to forecast extreme events and create time to adopt response policies, which would ultimately help avoid physical damage costs. The World Bank estimated in 2012 that if early-warning systems in low- and middle-income countries were upgraded to European standards, annual losses to assets of between US$300 million and US$2 billion would be avoided.[33]

As far as **risk transfer** is concerned, private-sector companies can leverage different mechanisms. There is a wide array of available investment instruments, risk-financing mechanisms and broader finance-relevant solutions that financial actors are already mobilizing in support of climate resilience across Africa. Financial instruments can be used to finance activities that build physical resilience to climate change impacts, reducing physical risk, and can also be used to respond to risks where physical climate impact cannot or has not been eliminated. Risk transfer mechanisms can be designed to compensate climate-related losses if a contingent variable falls outside an established range (for example a predetermined drop in commodity prices). For example, the African Risk Capacity is a sovereign risk pool and early-response mechanism designed to provide insurance to countries in the event of a contingency.[34] The African Risk Capacity's mission is to help members of the African Union protect the food security of their vulnerable populations. As an insurance risk pool, the African Risk Capacity has the objective of capitalizing on the natural diversification of weather risk across Africa, allowing countries to manage their risk as a group in a financially efficient manner to respond to probable but uncertain risks.

As a final step, companies could consider embedding climate-risk management into their governance, strategy and risk management processes. For example, when planning to invest in a new building, companies could consider the potential impacts of climate hazards. Anticipation of risk can lead to proactive choices in structural design and location to increase the building's resilience, such as designing it to withstand what used to be a weather event occurring once in 200 years. This could be more cost-effective than making retrofits in the future.[35] Companies in South Africa are increasing their awareness around embedding climate-risk assessments within their organizations at all stages of operations to address climate change, and even reporting their efforts through the Task Force on Climate-related Financial Disclosures, which provides guidance on how the financial sector can incorporate climate-related issues in its decision-making.[36]

> **Nearly 80 percent of the trillions that will be needed for adaptation has to come from the private sector. The private sector stands to gain enormously from making its operations and supply chains more resilient. At the same time, it provides ideas, solutions, technology, innovation to help countries and societies to build their resilience to climate change."**
>
> **Feike Sijbesma**
> Honorary Chairman, Royal DSM and Co-Chair of the Global Center on Adaptation

## Box 2. Challenges Faced by MSMEs in Africa in Adapting to Climate Risks

Photo: Jason_YU/iStock

Due to their limited diversified activities and internal capabilities, MSMEs in Africa can face significant barriers to identifying and adapting to climate risks.

**Climate-risk assessment**

MSMEs tend to focus on the current or recently experienced direct impacts of extreme climate events, while they have limited access to information on forecasted climate impact and events. In contrast to large companies in Africa, MSMEs often lack the capacity to generate data and information through risk assessments that use multiple climate models.

Business networks and collaboration between MSMEs and large corporations can help foster a more significant push toward adaptation in Africa. For example, sharing information from value-chain risk analyses conducted by large companies can help MSMEs understand and quantify their risks, and inform their decisions on elements such as insurance and infrastructure. Such measures are likely to also benefit large companies in the long term. Business networks can also play a vital role in building capacity and raising awareness for MSMEs. For example, the National Business Initiative, a group of national and multinational companies in South Africa cooperating on sustainable development efforts, provides MSMEs with resources on adaptation and climate finance.

**Adaptation measures**

MSMEs often find it difficult to relocate their assets and infrastructure or redistribute their supply networks when they are affected by transport, energy, and connectivity issues caused by climate hazards. This is mainly because their business activities may be restricted to a limited number of locations and supplier relations, and because they lack the capital and access to financial services to relocate or diversify their activities, or to develop emergency response mechanisms.

Therefore, MSMEs might undertake adaptation measures that are not capital-expenditure intensive and that focus instead on sectoral collaboration. Adaptation pathways that seek the collaboration of government, the private sector and civil society—known as multi-stakeholder partnerships—are becoming an increasingly important development paradigm in Kenya, for example. Through action and investment from donor-funded and public sectors—in areas such as research, data access, relationship development, business incubation and access to finance—multi-stakeholder partnerships are supporting private-sector actors in delivering adaptation resources to small-scale producers. This includes farmers in remote regions, who would otherwise fall outside of market inclusion, thus improving stakeholder engagement for different levels of the value chain. Partners within the PREPARED Project (Planning for Resilience in East Africa through Policy, Adaptation, Research, and Economic Development) in Kenya,[37] funded by the United States Agency for International Development, have invested in weather station upgrading and capacity building in the Kenya Meteorological Department. This has enhanced the quality of climate data and supported access for insurance companies to a robust index to determine commercially viable premiums for weather-index crop insurance for poor farmers.[38]

## THE ROLE OF PRIVATE ENTERPRISES IN ADAPTATION MEASURES OF COMMUNITIES AND THE BROADER ECONOMY

Private enterprises can effect change within supply chains while producing adaptation-related products and services that can benefit households.

Within their supply chains, companies can help upstream and downstream stakeholders build their resilience. In addition to building resilience in their own core activities (for example, by hardening assets, diversifying sources of procurement to avoid bottlenecks, selecting upstream and downstream companies that actively invest in their resilience), companies can help suppliers and vendors build their own resilience by sharing climate-related information and co-building disaster response capabilities. As an example, Enel, a multinational energy company active in five African countries, has been creating climate-risk forecasts and assessments via in-house experts, which are then shared with wider stakeholders.[39] Both Enel and its stakeholders can use this information to adapt activities to heatwaves, floods and other physical hazards that present risk to assets and operations in Africa. Sharing of information by large companies with the expertise and capacity to conduct thorough value-chain risk analyses can help smaller-scale players (for example, MSMEs) that lack equivalent capabilities. Especially for smaller companies, insurance premiums can be decreased through better risk data that lowers uncertainties and provides insight into residual risk exposure.

Companies can also provide adaptation-related products and services to help households and communities become more resilient. By taking climate change into account, adaptation-related technologies help reduce climate risk and contribute to improving development outcomes. These may include adaptation-related products such as air conditioning or drought-resistant seeds; adaptation-related services such as innovative insurance products; and provision of data and information more broadly. In addition to socioeconomic and finance-based systems, nature offers significant untapped potential to solve climate-related issues across Africa.[40] As an example, the multinational chemicals company DSM has produced enzymes for the food and beverage industry that can potentially reduce water consumption, which is key in regions that are expected to face an increase in water stress.[41] As another example, the OCP Group produces fertilizer tailored to local conditions, and trains farmers in Kenya, Nigeria, Ghana, Togo, Burkina Faso, Senegal, and Cote d'Ivoire in sustainable farming practices that improve land management, yields and incomes.[42]

In addition to contributing to boosting adaptation, companies can also play a role in swift recovery

Photo: boezie/iStock

from shocks. There are notable benefits from leveraging private-sector supply chains to bring aid immediately after natural disasters, sometimes faster or more effectively than government agencies. For example, Coca-Cola contributed bottles of water and logistical support to communities in Mozambique, Zimbabwe, and Malawi in the aftermath of Cyclone Idai.[43] More recently, in the light of the global pandemic health crisis, financial institutions in Nigeria formed a US$2.5 billion financing initiative to promote domestic manufacturing and other critical industries.[44]

While the physical effects of climate change can negatively impact jobs, proactive adaptation can protect jobs and even improve socioeconomic outcomes. Between 2008 and 2015, the International Labour Organization (ILO) estimates, Africa lost an annual average of 376 working-life years per 100,000 people of working age due to environment-related disasters caused or exacerbated by human activity.[45] This measure represents lost employment time, with its corresponding negative effects on production and GDP. Increasing the resilience of supply-chain stakeholders can help safeguard existing jobs and improve disaster-risk responses. It may also spur adaptation action to protect or shift jobs in sectors that face chronic climate risks, such as the threat of water scarcity in Africa's hydropower sector.

In addition to avoiding job losses and displacement, resilience can help support job creation in new adaptation markets. Resilience can also maximize green transition potential by safeguarding investments in promising sectors, such as energy and manufacturing. For example, the development of a cross-laminated timber industry in Africa could create more than 100,000 jobs by 2030 across the value chain and over three million jobs in the longer term, as cross-laminated timber is a low-carbon alternative to cement and steel in the construction industry.[46]

### Box 3. MSMEs can Provide Climate-Adaptation-Related Products and Services with Positive Effects on Employment

A survey of MSMEs in Africa by the Global Center on Adaptation (GCA) found that 95 percent saw opportunities for business expansion while managing climate risks:

- 81 percent identified new products
- 22 percent found new markets for existing products
- 60 percent identified opportunities for new markets.[47]

For example, MicroInsurance Services in Malawi provides weather-related information in addition to risk insurance, capitalizing on demand for information on adverse climate impacts. Other MSMEs have found their market in providing organic fertilizer or farm machines powered by renewable electricity. Innovation by MSMEs can meet market needs while contributing to employment. MSMEs are the main engines of job creation in most countries in Africa. In addition, because they are smaller and more local, MSMEs can create adaptation solutions that meet local needs.

For example, the ILO's Zambia Green Jobs Programme in 2013–2018 aimed to create 5,000 green jobs and improve the quality of at least 2,000 jobs, specifically in MSMEs, to boost the sustainability and competitiveness of these companies. These jobs in the construction sector, mainly filled by young people, were expected to improve the incomes and livelihoods of over 8,000 households.[48]

Photo: Nataly Reinch/Shutterstock

## COLLABORATION ACROSS THE PRIVATE, PUBLIC, AND FINANCIAL AND INSURANCE SECTORS IS REQUIRED IN ADAPTATION

Within the private sector, companies may collaborate to share information and unlock transformational outcomes. Large companies can undertake risk assessments to generate information about climate impacts on their operations and supply chains. MSMEs often lack the capacity to do the same, and the resilience of a country's private sector may then be improved by sharing climate data and adaptation knowledge with multiple stakeholders, including MSMEs.[49] As an example, Acre Africa has partnered with telecommunications and finance organizations, gathering joint expertise to distribute microinsurance products, such as mobile-based weather-index insurance, multiperil crop insurance, and livestock coverage to over 1.7 million farmers in the region.[50] Similarly, The National Business Initiative, a voluntary coalition of South African and multinational companies working toward sustainable growth and development in South Africa, provides resources on adaptation and climate finance to MSMEs.[51] Finally, intercompany collaboration can reduce costs through economies of scale. For example, companies may join to create a particular piece of infrastructure that is relevant for the whole sector.

The public sector is a key enabler of private-sector action due to its role in setting overarching national priorities; building a clear regulatory framework to support these priorities; and offering support via technical assistance, data sharing and access to capital. In this sense, National Adaptation Plans (NAPs) and Nationally Determined Contributions (NDCs) are key resources to establish long-term expectations and indicate priority areas for private-sector participation. To ensure credibility and usefulness, both NAPs and NDCs need to be consistent with macroeconomic parameters and budgets. In terms of regulation, governments have a direct impact in shaping markets, such as creating green building standards that reduce energy use, requiring companies to conduct climate-risk assessments or incorporate resilience into public procurement criteria.[52]

Direct support from the public sector can take the form of capacity-building initiatives or de-risking mechanisms that lower the cost of capital. As an example, the public sector may share information or conduct training about climate-related risks to reduce uncertainty and guide decision-making for the private sector. Social protection programs can be effective at reducing climate risk.[53]

MSMEs are likely to benefit most from such programs, as they are less likely to have the in-house capacity to produce climate-risk data themselves. The GCA survey of African MSMEs found that 29 percent lack climate data, while 17 percent of MSMEs said they lack knowledge on climate impacts.[54] Climate information services have also been identified as a priority by the Africa Adaptation Initiative, which currently ranks Sub-Saharan Africa last among all regions in terms of land-based observation networks. Access to adequate information can also facilitate adaptation-related financing. Robust information on climate hazards, exposures and vulnerabilities can help prove the adaptation relevance of a project, potentially allowing access to more favorable loans.

The financial services sector plays a role by creating new products, monitoring climate risk and incentivizing adaptation actions. As an example, parametrized insurance can reduce transaction costs in writing and administering insurance policies while protecting against climate events by minimizing their financial damage. There is also a role for innovation, resulting in products such as a municipal bond "wrapped" into a catastrophe bond.[55] This instrument minimizes the need to assess climate risk for investors holding the bond, thus encouraging investment. Innovation is key for project funding as well, since investments in adaptation can sometimes result in short-term income losses that make it difficult to obtain traditional project funding.[56] Potential solutions may include alternative currencies or blended financing. In addition, increased monitoring of climate risk facilitates risk management, especially for private banks, who will need to increase risk monitoring to prepare for the growing call for climate disclosures. Finally, banks can make loans contingent on climate adaptation criteria to incentivize action by companies or make finance-specific adaptation-related actions.

## Box 4. Improving Resilience via Public–Private Partnerships (PPPs)

Robust PPP frameworks can help allocate risk to best manage uncertainties while maximizing benefits. According to the World Bank's Private Participation in Infrastructure database, Africa has secured less than 7 percent of global PPP investments over the last decade. Most African countries (35 out of 54) have PPP legislation and units, but the majority do not include elements of climate resilience and adaptation. Improvements to PPP frameworks can incorporate these elements as well as increase investor confidence by making the frameworks more robust overall.

PPPs used to provide public infrastructure can help economies become more resilient and support development overall. For example, the 2000 flood destroyed roads and rail lines in Mozambique, disrupting logistics internally and to Zimbabwe, resulting in economic losses and the lowest level of economic growth in two decades. In collaboration with the World Bank Group, the Public-Private Infrastructure Advisory Facility, and the African Development Bank, among others, the GCA established the Climate-Resilient Infrastructure Officer Program to incorporate climate adaptations into PPPs. As part of the GCA Africa Adaptation Acceleration Program (AAAP), this project is working with the Ministry of Finance and the National PPP Unit in Ghana to enhance climate adaptation and resilience of the $570 million Accra–Tema Motorway PPP.

Photo: Delali Adogla-Bessa/Shutterstock

## Box 5. Potential Areas for Future Research on the Private Sector and Adaptation in Africa

To build climate resilience, companies need to understand the full breadth of their climate risk, as well as the practical options they have to reduce risk and capture new opportunities.

However, limited availability and lack of granularity in climate and socioeconomic data in Sub-Saharan Africa can be salient bottlenecks in climate-risk quantification. Limitations can range from lack of availability in robust climate data (with relevant climate variables, thresholds, and uncertainty handling), to lack of locally relevant damage functions to assess vulnerability and lack of exposure data (with asset and activity values). Thus, further research is needed to make available the necessary climate and socioeconomic data to feed into risk quantification of direct losses. Going further, as a substantial portion of the value at risk lies with indirect impacts, further research is needed to quantify the potential financial and job losses due to upstream and downstream supply-chain disruptions (for example, due to transport network disruption, or energy infrastructure shocks).

Based on a robust understanding of direct and indirect value at risk from climate change, the private sector can then move to weighing adaptation options, investment plans, and operationalization. To support companies in this journey, further research is needed to convert identified risks into investment needs, and more precisely investments that can be carried by the private sector. This requires an understanding of potential adaptation choices (capital and non-capital intensive; co-benefits with decarbonization, nature and socioeconomic development), and business models that can work for the private sector. Additional areas for research that are key to operationalization would be contractual models that can allocate risks efficiently across value chains (for example, by protecting vulnerable smallholders), and insurance models that can extend coverage in Sub-Saharan Africa.