

Climate Change: Toward a More Resilient Africa

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1. Context

The impacts of the invasion of Ukraine on agricultural exports and fertilizers, the food price hikes, the inflationary pressures, the unsustainable debt levels for many countries, and the possible global economic recession are severely impacting African economies and communities. In addition, the climate is changing, and Africa needs to adapt. It must adapt to rising temperatures, more extreme storms, and floods, rising sea levels, more intense heatwaves, and longer and more severe droughts. Yet though the risks are great, so also are the opportunities that successful adaptation can bring.

Our analysis shows that the impacts of the climate emergency continue to intensify in Africa, compounding and amplifying other crises. Africa can still prosper and thrive in a world of climate change. This development is dependent on understanding, preparing, and adapting to oncoming climate impacts.

This viewpoint analyzes how climate change adaptation impacts Africa. It is based on the 2022 flagship Global Center on Adaptation (GCA) State and Trends in Adaptation Report 2022: Africa.¹ It argues that adaptation to climate change is more than ever a crucial strategy to minimize the impacts on livelihoods and build resilience in the long run. This viewpoint focuses on measures to accelerate adaptation in Africa in key areas such as livestock, agriculture, cities, nature-based solutions, blue economy, and coastal erosion.

While it cannot prevent all losses and damages, there are a range of options that can be broadly applied across sectors, including disaster risk management, climate services, and risk spreading and sharing. Multi-Hazard Early Warning Systems (MHEWS) are critical for adaptation and disaster risk reduction.

¹ This viewpoint is based on our detailed assessment in the report of the Global Center on Adaptation: State and Trends in Adaptation Report 2021: Africa. <https://gca.org/reports/sta22/>

2. Current Challenges

There is a growing impacts of climate change on African nations. They are substantially impacted by natural hazards, which are set to increase in severity and frequency with climate change. Between January 2021 to September 5, 2022, more than 54 million people were affected by disasters linked to storms, droughts, wildfires, floods, and landslides in Africa. Drought-related disasters affected the most people in Africa over this period, followed by floods. Eastern Africa has been hit the hardest by climate-related disasters, with a total of more than 33 million people who were injured, affected, or killed. In North Africa, the greatest impacts were from floods and wildfires. In the past decade, most disasters triggered by natural hazards globally were caused by extreme weather and climate-related events such as heatwaves, floods, and storms. This number has been increasing since the 1960s and has risen almost 35 percent since the 1990s. Between 2011 to 2020, the disasters that have affected Africa have mostly involved droughts and floods. On average, approximately 13 million people per year were impacted by droughts over that period, and 3.5 million were impacted by floods.

For Africa, climate risks are expected to pose significant challenges to food security. African food systems are particularly vulnerable to climate extremes and shifts in weather patterns, as food production is largely dependent on rainfed agriculture and pastoralism. According to the IMF, in 2022, at a minimum, 123 million people (12 percent of Sub Saharan Africa's population) are projected to be acutely food insecure—suffering from high malnutrition and unable to meet minimum food consumption needs. At least 28 million of these people became acutely food insecure over the past two years due to successive shocks raising food prices and depressing incomes, especially for the most vulnerable.²

Considerable negative impacts of a changing climate are also expected for marine and inland fisheries. Water-dependent sectors across Africa are also largely and negatively impacted by extreme variability. Extreme hydrological variability will progressively amplify under all climate change scenarios (relative to the current baseline), depending on the region. The number of people projected to experience water stress by the 2050s varies widely, with decreases or increases by hundreds of millions. This requires planning under high uncertainty.

3. Adaptation Measures

Funding Gap

Barriers to climate change adaptation in Africa include an enormous funding gap which is holding Africa back. Our recent analysis by the Climate Policy Initiative and the Global Center for Adaptation shows that an annual average of \$29.5 billion in climate finance was committed to Africa in the years 2019 and 2020. Of this amount, about \$11.4 billion, or 39 percent, was for adaptation investments. An analysis of NDCs indicates that the adaptation finance needs for the continent over the period 2020-30 are close to \$580 billion. Unless adaptation finance increases substantially in Africa, a gap of \$453 billion will accumulate over this decade^{3 4}.

² <https://www.imf.org/-/media/Files/Publications/DP/2022/English/CCCFISSAEA.ashx>

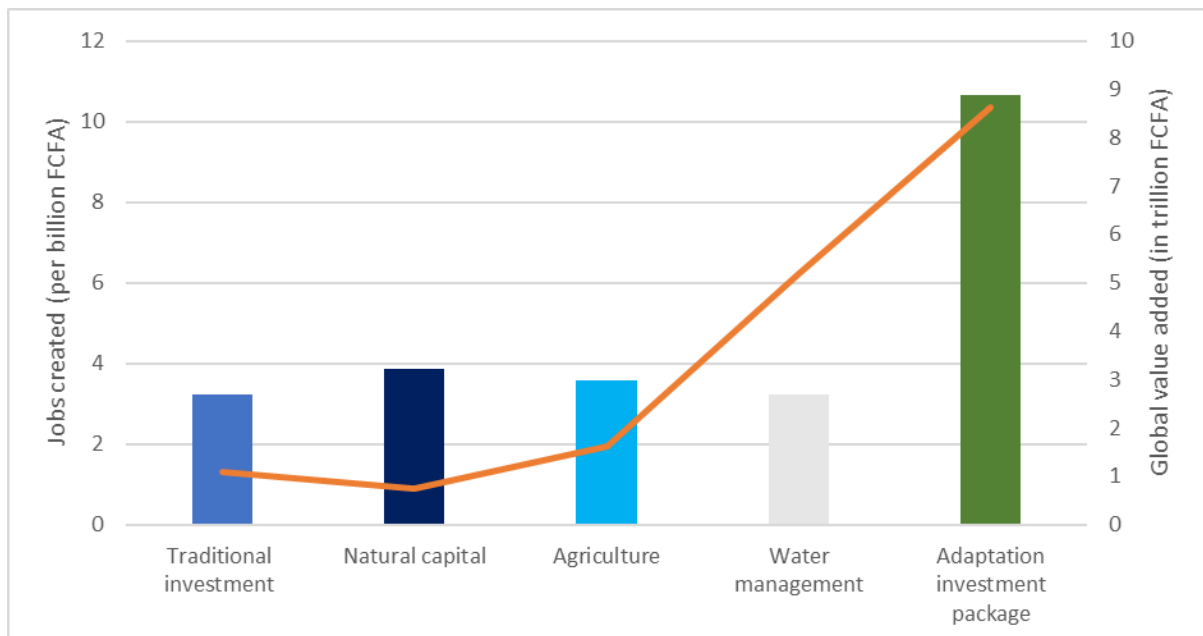
³ Climate Policy Initiative (2022) The Landscape of Climate Finance in Africa
<https://www.climatepolicyinitiative.org/publication/>

⁴ IMF (2022) Regional economic outlook. Sub-Saharan Africa : living on the edge
<https://www.imf.org/en/Publications/REO/SSA/Issues/2022/10/14/regional-economic-outlook-for-sub-saharan-africa-october-2022>

The largest sources of adaptation finance are multilateral development institutions (53 percent), African governments (23 percent), and bilateral agencies (16 percent). The private sector represents a very small fraction of adaptation finance 3% of tracked and out of this nearly 90% was committed by institutional investors (foundations, insurance companies, asset management firms, pension funds, and endowments). More than half (53 percent) of the adaptation finance commitments to Africa were loans.

To increase the level of adaptation financing, it is important to see it not as a sunk cost to reduce the impact of disasters. Rather, mainstreaming adaptation in economic sectors and selecting investments that enhance the resilience of communities and nations have high levels of economic benefit-to-cost ratios. To understand the benefits of a sustainable recovery investment program that puts adaptation and resilience at its core, together with UNECA, we modelled for several African countries (Senegal, Cote D’Ivoire, DRC, Egypt, Kenya, and South Africa¹) and compared a traditional stimulus package versus a package centred around the most needed adaptation and development programs.

In every country, the economic returns and jobs generated are higher in an adaptation-focused stimulus package. For example, our modelling shows that in Senegal, investment in adaptation initiatives could create over 200 percent more jobs within five years (600 percent within 20 years) and around 700 percent greater economic value in 20 years) relative to a traditional stimulus financial package focused on gold and phosphate mining and the extraction mining hub. The adaptation-focused package includes investments in *natural capital* (such as coastal protection, aquaculture, and reforestation), agriculture (resilient seeds and agroforestry), and water management (water demand management and flood mitigation). Investments in adaptation to climate change are not to be seen as sunk costs but as an integral part of sustainable economic recovery packages with high benefit-to-cost ratios.



Regulating Climate Risks

African nations are among the most vulnerable in the world to climate risks. In 2019, five African nations ranked among the ten countries around the globe most affected by extreme weather. Topping the list was Mozambique, which was struck by two devastating cyclones and a severe long-lasting drought.

Such severe impacts not only take a huge toll in terms of human suffering, but they also have major consequences for financial institutions and financial markets. Across all of Africa, climate change is already reducing economic growth and reversing hard-won gains, the Intergovernmental Panel on Climate Change (IPCC) reports. Unless banks and other institutions take action to identify and manage these risks, they will experience a damaging deterioration of credit quality and profitability.

There are two main types of climate risk: 1) property damage, business disruption, and other physical risks from such impacts as more severe floods and droughts; and 2) the transition risks from falling behind in the global effort to reduce greenhouse gas emissions. Those transition risks can include stranded fossil fuel assets and the need for increased capital spending on cleaner technologies.

Some Africans have recognized the need to identify and regulate such risks. The Bank of Ghana has issued voluntary “sustainable banking principles” as part of its environmental and social risk management, for example, while Kenya’s 2016 Climate Change Act provides both a regulatory framework that responds to climate change and a mechanism for climate finance. Moreover, interviews with finance officials show that climate risk is a top and urgent priority for almost all financial officials.

Yet the efforts to integrate climate risk in financial systems face significant challenges, including the lack of data on climate risks and the lack of internal capacity to develop regulations and guidelines.

Improving productivity and resilience with livestock

Raising livestock provides a living for millions of Africans. Overall, the livestock sector accounts for 55 percent of the household income in pastoral systems across Africa. The sector will become even more important as the demand for meat and dairy in Africa is predicted to triple by 2050. These livestock systems and livelihoods are being increasingly threatened by rising temperatures, more extreme precipitation and droughts, and other climate change impacts. Just one impact—heat stress suffered by cattle—could reduce the production of milk and meat by hundreds of millions of dollars per year by 2085, modelling studies suggest. Climate change is also enabling pests like ticks to expand their ranges in Africa and is reducing the productivity of the grasslands and agricultural crops that cattle, camels, and other animals need for feed.

There thus is an urgent need for adaptation measures. Potentially effective interventions fall into several broad categories: breeding cattle and other livestock to be more heat and drought tolerant and disease resistant; improving management of range and croplands to make the feed supply more sustainable; developing better treatments for diseases; establishing feed inventories and feed stores; and providing both early warning alerts and adaptive safety nets for herders and livestock farmers. One promising approach is adding trees to rangelands in “silvo-pastoral” systems, where the trees provide shade to reduce heat stresses. It may also be possible to boost local incomes through carbon credit trading and benefit sharing when rangelands are restored.

Improving productivity and resilience in agriculture

Agriculture is the foundation of lives and livelihoods in Africa. More than 60 percent of Sub-Saharan Africans are smallholder farmers, and nearly a quarter of Africa’s GDP comes from

agriculture⁵. Not only can successful adaptation improve yields and livelihoods, adaptation measures also are far less expensive than paying for repeated disaster relief and recovery efforts in the wake of extreme weather events. Moreover, effective adaptation measures will enable agriculture to be an important part of the effort to mitigate climate change, because it has the potential to offset or sequester as much as 20 percent of annual emissions through improvements in soil management. Realizing these benefits requires a transition to a new way of thinking about climate-smart agriculture including taking advantage of advances in breeding technologies and tool development; improving soil health: harnessing smart technologies, such as artificial intelligence, robotics, and smart sensors linked to the internet and big data.

Implementing these climate-smart approaches will require investing more in rural agricultural infrastructure, expanding broadband internet availability, bundling digital services, and creating regional networks of plant breeders and other scientists to share knowledge, tools, and equipment. Moreover, these efforts must specifically target women, since women account for about half of the world's smallholder farmers and grow 70 percent of Africa's food.

Making cities more resilient

The populations of major cities in Africa, especially the capital cities, are growing rapidly, both because of migration from rural areas and small towns and because of natural population growth. Of the 100 fastest-growing cities in the world, 79 are in Africa. But the provision of basic urban infrastructure has not kept pace with population growth. Water supplies, sanitation, energy, transport, durable housing, and other vital services are inadequate. Jobs are in short supply. As a result, many cities now are seen as being at “extreme risk” of climate hazards, especially because of large informal settlements that are particularly vulnerable to flooding, heatwaves, droughts, and (in coastal cities) sea level rise.

Implementing nature-based solutions such as agroforestry

The power of nature can be harnessed to successfully adapt to the impacts of climate change and to increase resilience. Restoring forests or wetlands upstream of cities can help solve problems like urban flooding and water scarcity, for example. Protecting and regrowing mangrove forests fights coastal erosion and enhances local fisheries. Creating parks and green spaces in cities reduces the urban heat island effect and the risks of flash floods. In fact, more than a third of the priority adaptation actions in the Nationally Determined Contributions of African countries involve so-called nature-based solutions (NbS).

One especially effective NbS in many parts of Africa is agroforestry—a land management practice where trees are grown around or among crops, pastureland, or homes to provide shade, shelter, fertilizer, fuel, food, fodder, and other products. Not only can agroforestry increase crop yields, land productivity, and local incomes, it also fits well with current African farming systems, skills, and livelihoods.

Agroforestry can involve a variety of practices and forms. In the Sahel region, many farmers have allowed the regeneration of root stocks or seeds long buried in the soil, thus regrowing a few dozen trees per hectare on their fields. This practice, called Farmer Managed Natural Revegetation (FMNR), is credited with helping to “regreen” hundreds of thousands of hectares of farmland in

⁵ Global Center on Adaptation: State and Trends in Adaptation Report 2021: Africa, <https://gca.org/reports/sta22/>

countries such as Niger and Burkina Faso, bringing substantial increases in yields and incomes, while also helping to restore soils and water resources.

In another example, experiments on 25 agroforestry plots in Togo show that most beneficial agroforestry mix includes shade trees, fruit trees, palms, and bananas. In addition, in other parts of Africa, a tree called *Faidherbia alba* offers substantial benefits. A nitrogen-fixing tree that is widespread and native to Africa, *Faidherbia* has an unusual annual growth cycle. Because it sheds its foliage early in the rainy season and regrows it early in the dry season, it does not compete with crop species, which grow during the rainy season. Its leaves also provide useful fodder for livestock.

It is now essential to continue building the case for nature-based solutions in general, and for agroforestry in particular, as critical adaptation measures. Unfortunately, there are still too many examples of poorly designed agroforestry efforts that end up undermining development, mitigation, and adaptation. As a result, it is necessary to provide more support for research that pinpoints which actions are most cost-effective and most beneficial for both farmers and ecosystems, and to take better advantage of the considerable traditional and local knowledge of workable solutions. Co-creation of solutions that will be adopted by farmers is the way to go.

Improving the sustainability of Africa’s “blue economy”

Africa’s 34 coastal countries depend heavily on a “blue economy” based on fisheries, aquaculture, tourism, transport, ports, coastal mining, and energy. Continent-wide, these coast-based activities are worth more than \$300 billion per year and support 49 million jobs ⁶.

The blue economy will become even more important if countries seize the opportunity to increase the amount of carbon captured and stored by coastal ecosystems such as mangroves, kelp forests, seagrass beds, and salt marshes. This “blue carbon” could be used to help countries meet their greenhouse gas emissions reductions targets and to bring in new revenue through carbon capture credits.

As with other sectors, however, the blue economy faces huge challenges. Fisheries are being overexploited. Coral reefs, kelp beds, and mangrove forests are disappearing. With sea levels rising and natural protections being lost, coastal erosion is increasing (see next section). Marine heatwaves and water acidification are predicted to reduce primary production by phytoplankton, further bleach coral reefs, and change fish distribution and abundance—with profound potential consequences for fisheries and tourism. Yet only 26 of the 34 coastal countries have formal strategies or policies to protect their blue economies. There is thus an urgent need to create such plans.

The important elements of effective national strategies include coastal and marine spatial planning that takes climate change into account, fisheries regulations that adjust allowable catches based on real-time fish stock data, efforts to protect marine and coastal ecosystems, and rehabilitation and restoration measures such as planting of nursery-grown corals back onto natural reefs or creating artificial reefs; planting mangrove and seagrass seeds in damaged habitats; and transplanting kelp.

One of the success stories in making the blue economy more sustainable is the Seychelles Marine Spatial Plan (SMSP) Initiative. The plan set a goal of expanding marine protected areas from only

⁶ Global Center on Adaptation: State and Trends in Adaptation Report 2021: Africa. <https://gca.org/reports/sta22/>

0.04 percent of the country's marine waters to 30 percent—a goal that was reached in in March 2020, ten years ahead of schedule. The Seychelles government succeeded because the effort was backed by strong political will, because it tapped into numerous resources, experts, and scientific data to understand the problem and solutions, and because it developed an effective funding strategy (in this case, a debt conversion). Those lessons should be applied in other African countries.

Protecting coasts from erosion

Africa's ports are tremendously important as drivers of Africa's economic growth, especially in West and North African countries with no land access to distant consumer markets, but they are suffering from serious erosion. A 2021 World Bank study showed that the costs of erosion in the Maghreb countries of North Africa already range from \$273 million per year in Libya to more than \$1.1 billion per year in Tunisia. Sea level rise, more extreme storms, ecosystem degradation, and the trapping of sediment by upstream dams are making the problem worse, helping to create coastal erosion rates up to 10 times higher than the global average.

Traditionally, countries around the world have used “hard” infrastructure, such as groins, breakwaters, jetties, revetments, and dykes to protect ports. Hard infrastructure is expensive, however, and does not provide long-term protections without costly long-term maintenance.

The better solution for West African countries is using nature-based solutions (NBS), also known as “soft” or “green” infrastructure, such as restoring mangroves, dunes, seagrasses, wetlands, and other ecosystems. One promising project is the "Management of Mangrove Forests from Senegal to Benin" initiative funded by the European Union for a period of 5 years (2019–2024).

4. Conclusion

Africa is facing multiple shocks while not yet recovered from the COVID-19 pandemic crisis. The intensity and frequency of climate shocks continue to accelerate. As discussed in this paper, mainstreaming climate adaptation in development programs, poverty reduction actions, and economic stimulus programs, make sense from the economic and livelihoods perspective. The level of financing for adaptation continues to be inadequate. The opportunities for climate adaptation at scale are numerous but still need testing and localization in the Africa context. This note has shown some practical examples from cities to blue economies. Adaptation to a rapidly changing climate needs to touch every aspect of economies and societies for a greener and more prosperous Africa.

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