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# **Adapting to Climate Crisis in Africa: The Impacts of Technology and Small Businesses**

**Oyebamiji A. Usman**

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Zaman-Allah Mainassara Abdou, a maize scientist with CIMMYT demonstrating an UAV used in data collection at the CIMMYT Chiredzi research station, Zimbabwe. Credit, Busani Bafana/IPS

## Introduction

As floods, droughts, and locust invasions become more severe across Africa, the economic effects of climate change are manifesting themselves in various ways. For instance, droughts are becoming more intense in the Sahel. The temperatures are rising 1.5 times faster than in the rest of the world and could reach five degrees Celsius above pre-industrial levels (The Point, 2022).

Many African countries are heavily reliant on climate-vulnerable sectors such as energy, tourism, water, and agriculture to survive and grow their economies (Dlamini, 2022). While Africa has contributed negligibly to the changing climate, with just about two to three percent of global emissions, it stands out disproportionately as the most vulnerable region in the world. This vulnerability is driven by the prevailing low levels of socioeconomic growth on the continent. While climate change is global, the poor are disproportionately vulnerable to its effects. This is because they lack the resources to afford the goods and services they need to buffer themselves and recover from the worst of the changing climate effects (UN Environment Programme report). This is the case in Africa.

Richard Munang, deputy regional director of the United Nations Environment Programme (UNEP) Africa Office, says that Africa is at a critical juncture and solutions must be found. Climate experts have noted that adaptation work ranges from planting crops that can withstand extreme weather and maintain soil health to restoring mangroves that buffer coastal communities from rising sea levels and support biodiversity, setting up early warning systems for storms, and expanding green spaces in cities to absorb heat and improve air quality (Collins, 2022).

It could include simple changes in labour, such as creating mandatory rest breaks in the shade, providing free drinking water, shifting work to cooler hours of the day, and providing thinner protective clothing. Or it could require more fundamental changes to the way factories are built so they stay cool and use less energy.

One of the challenges of adaptation is that solutions vary widely across communities, countries, and regions depending on the impacts and needs, unlike mitigation, where solutions such as solar panels or heat pumps can be applied worldwide (Njung'e, 2022). That means adaptation work needs to be more locally led, with investments designed to build local capacity in the long term.

## **Current Events and Situation**

Adapting to the physical risks of climate change is also a bigger worry for the private sector in emerging economies than making the switch to a lower carbon world, according to a survey that the CDC Group, a UK development finance organization, did with its investees.

It found that 78% of respondents said that their businesses were taking or planning action to identify physical climate risks, while 70% said the same for transition risks associated with moving to a low-carbon world, such as policy changes, reputation, and market changes.

"I think physical risk is more real because people have experienced it before; they can see it and they can feel it," Judith Munyurwa, CEO at Zebu Investments, told the survey.

Just under half of respondents said extreme weather—most commonly drought or heavy rain had disrupted their business, and around 40% were taking steps to reduce their vulnerability to physical climate risks (Worley, 2021).

Similarly, Philip Antwi-Agyei of Ghana’s Kwame Nkrumah University of Science and Technology noted that while climate change adaptation strategies could cushion some of the impacts for smallholder farmers in sub-Saharan Africa, there would likely be trade-offs that must be well communicated.

These trade-offs might include higher costs, additional labour requirements, and competition among objectives or available resources, Antwi-Agyei said. He also said that putting adaptation measures into place would have other benefits, such as increased productivity, stable yields, and protection of the environment.

Meanwhile, the African Union recently published the Climate Change and Resilient Development Strategy and Action Plan (2022–2032) for Africa (AU CC Strategy), which is a 10-year strategic planning document to address the impacts and encumbrances of climate change that hamper Africa's integration and development. The AU CC Strategy aims to assist Africa in taking advantage of opportunities related to the transition to a low-emission [green economy](#) and green recovery efforts by providing a continental framework for collective action and enhanced cooperation in addressing climate change issues (Rapson et al, 2022). It also acknowledges that while adaptation and resilience-building remain Africa’s top priorities, mitigation actions will also be required as part of the region’s climate response.

## **Why Small Businesses for Climate Adaptation?**

African small and medium-sized enterprises (SMEs) can play an important role in mitigating the effects of climate change (Runde, Savoy & Staguhn, 2021). According to the Organization for Economic Cooperation and Development, SMEs are independent firms that employ less than a given number of employees. For example, a medium-sized enterprise employs under 200–250 employees, while small firms have fewer than 50 employees. A microenterprise typically employs 10 people or less, so this includes smallholder producer groups. SMEs are responsible for about 80 percent of employment in Africa.

Combating climate change presents new chances for economic expansion, growth, and job creation. Businesses can save money, get new clients, and maintain their competitive edge by reducing emissions. Decarbonizing and cutting emissions at the SME level has benefits. It creates a more resilient supply chain overall, especially as the impacts of [climate change](#) become more uncertain and severe, as the Harvard Business Network has indicated (Mendiluce, Falk, & Rönn, 2022). The COVID-19 pandemic, for example, led to significant challenges across 57% of the supply chain, showing that "when small business suppliers struggle, larger operations falter too," it added.

A report on small business development in the climate change adaptation space in South Africa says the country is especially vulnerable compared to many of its peers. The report advocates for more adaptation, arguing that it opens opportunities for innovation, both at the policy and business levels (4IRSA, 2021).

"Despite the challenges... SMMEs, and particularly small businesses (i.e., micro, very small, and small enterprises), are particularly well-suited to seize such opportunities," it reads.

However, the potential for adaptation-driven needs, investments, and mechanisms to generate socioeconomic opportunities for small businesses remains largely unexplored and misunderstood. The focus has been on mitigation-driven prospects, on the premise that mitigation-related interventions and investments are more financially viable and provide more imminent benefits.

The researchers believe including small businesses must be an integral part of the adaptation process, as it assures holistic approaches to development.

"Small businesses are well-suited to seize such opportunities; however, the potential for adaptation-driven needs and investments to generate socioeconomic opportunities for small businesses remains largely unexplored and misunderstood."

"While small businesses are known to have particular characteristics that enable them to take advantage of such opportunities, they face challenges relating to their size, limited resources, unfavourable policy, and industry and market conditions."

"Small businesses in the adaptation space also face additional constraints that are specific to the novel and uncharted territory they operate in," they say.

## **"Climate Action in Africa: Our Responsibilities"**

Global Head, Client Relations at Afreximbank, Rene Awambeng, noted the impacts of the growing urban population in Africa on energy demand for industrial production, cooling, and mobility (Jeremiah, 2022).

According to him, energy demand in Africa grows twice as fast as the global average, and Africa's vast renewable resources and falling technology costs can drive double-digit growth in the deployment of utility-scale and distributed solar photovoltaic (PV) and other renewables across the continent.

He noted that although clean energy and decarbonizing international investment and finance seem to be dominating the development discourse, Africa could leverage its vast base of existing solid minerals, including rare-earth minerals and metals that would fuel clean energy.

Larger companies, including multinationals, often rely on small businesses as part of their supply chains (Chaudhury, 2019). To better sustain their own businesses, these companies can invest in financial and technical assistance for their local suppliers. In Uganda, Café Direct supports farmers who grow tea for the company by promoting disease-resistant tea varieties, planting trees to improve land productivity, and installing water tanks to harvest rainwater. In Kenya and other parts of Africa, Unilever is also investing in tea plants that are drought- and disease-tolerant. These adaptation measures help companies and workers throughout the supply chain.

While a large number of larger firms are still struggling to find ways toward climate adaptation, in some parts of Africa, such as Nigeria, indigenous social enterprises and businesses are creating innovations to support the country's transition to a low-carbon and resilient economy.

- **Planet 3R:** Planet 3R is a social enterprise dedicated to converting textile and plastic wastes into [eco-friendly products](#) using the 3R (reduce, reuse, recycle) to save our planet Earth by weaving them into innovative items. The enterprise converts textile and plastic wastes into affordable eco-friendly products for low- and middle-income earners.
- **Quadloop:** Founded in 2016 by Dozie Igweilo, [Quadloop](#) is an electronics manufacturing firm that offers hardware devices, solar-powered lamps, and gas monitoring systems. The Nigerian social enterprise is on a mission to create eco-friendly solutions to make the world healthier, cleaner, and safer.
- **Oretronics Technology:** Oretronics Technology develops and manufactures [solid-state lighting products](#) for the Nigerian market that consume 90% less energy than incandescent lighting and save 90% on lighting costs. It also deploys lithium-ferrous phosphate (LFP)-based energy storage systems, hybrid solar energy systems, and batteries.
- **Mitimeth:** MitiMeth designs and produces woven décor, rugs, lighting, diningware, art décor, stationery, gifts, and fashion accessories from harvested invasive aquatic weeds that flourish in Nigeria's waterways. The company also trains riverine and riparian communities to make handcrafted products and employs local people to create these crafts. MitiMeth, which was founded in 2011 with modest beginnings, is now a well-known indigenous award-winning social enterprise.
- **Vectar Energy:** Yetunde Deborah Fadeyi founded Vectar Energy. 23 years after an event that occurred in 1999, her best friend's family died from carbon monoxide poisoning from a small gasoline generator in Nigeria. Her vision is to replace every small petrol generator in Nigeria with a Vectar Eco portable station so that some of her best friends and family members in Nigeria do not have to live her experience at the most affordable price. Lagos-based Vectar Energy is a portable power company that provides affordable, reliable, and [sustainable energy](#) through an incentivized cleantech and fintech platform.
- **Think Bikes:** Think Bikes is a new bike sharing service that is operating in higher education institutions, estates, and factories in Nigeria through the use of mobile apps. The company designs and manufactures bicycles with full [ergonomics](#); they are electric bicycles, and they make your rides as enjoyable as possible. Consider bicycles to be an inexpensive and environmentally friendly mode of transportation for both goods and people.

- **EcoTutu:** EcoTutu, a [clean tech](#) company with significant impact in making cooling affordable and accessible for businesses, especially in the agriculture and health sectors, It designs, develops, and deploys affordable cold value chain technology using the Internet of Things (IoT) and renewable energy. The company has built a suite of cold chain solutions that are transforming the way businesses in the agriculture and health sectors preserve and transport temperature-sensitive products.

## **Climate Change Adaptation in Africa: The Need for Technological Innovations**

In the years to come, preparing for the impacts of climate change, known as climate change adaptation, will be key for African nations. Adaptation—reducing countries’ and communities’ vulnerability to climate change by increasing their ability to absorb impacts and remain resilient—is a key pillar of the Paris Agreement. UNEP’s Adaptation Gap Report 2020 found that while nations have advanced in planning and implementing adaptation projects, huge gaps remain, especially in finance for developing countries (UNEP, 2021).

Developing and deploying green technologies to mitigate and adapt to the worst effects of climate change are crucial dimensions of efforts to build resilient and sustainable societies. They are particularly important in Africa, one of the continents that will be most adversely affected by climate change (Astruc, 2016).

The findings of the "Adapt, Mitigate, and Grow" report recently published by EIT Climate-KIC and research firm Briter Bridges on the state of the climate tech ecosystem on the African continent indicated that: between 2014 and Q1 2022, climate tech start-ups in Africa cumulatively raised just over \$2.1 billion in disclosed funding, accounting for 14.7 percent of the total investments raised by digital- and technology-driven start-ups in the same period.

In 2021 alone, record funding for climate tech companies reached at least \$440 million, demonstrating the growth of climate-focused start-ups and the increased number of active investors. Within climate technology, renewables emerged as the best-funded sector in terms of deal volumes between 2014 and 2022, receiving 75 percent of the disclosed funding (EIT Climate-KIC, 2022).

Sustainability and climate change expert, Dr. Eugene Itua, said involving the SMEs in climate action would involve strategic and well-informed inclusion of the private sector, especially the small and medium-sized enterprises (SMEs), in climate change adaptation and mitigation planning and activities (Okonji, 2020). This must be a key part of efforts to meet Nationally Determined Contributions (NDC) targets. "So by all accounts, in engaging the private sector for climate-smart investments to support the various countries in meeting their NDC targets, the SME must be seen as the cornerstone to growing climate business opportunities in Africa," he added.

## **African Innovation Focusing on Climate Technology: The Forces and Mobilizers**

There are only a handful of innovation hubs and funds in the area that actively support climate tech solutions, despite the fact that it has been highlighted as a potential growth sector. A few of these are:

- **MultiChoice:** MultiChoice, an entertainment and media company, is investing in Africa and has committed to helping deliver a [sustainable future](#) for the continent (Dlamini, 2022). Now MultiChoice is collaborating with The Earthshot Prize, an ambitious global environmental prize, with the goal of finding innovative solutions to the world's biggest environmental problems.
- **The Africa ClimAccelerator:** The Africa ClimAccelerator supports [early-stage businesses](#) with climate technology solutions by providing support and building capacity in East, West, South, and North Africa. The first pan-African climate accelerator focused on startups that put sustainability at the forefront of their missions and growth.
- **The African Youth Climate Hub (AYCH):** The African Youth Climate Hub is an initiative to respond to and amplify the [voices and actions of youth](#), starting with African youth. The Moroccan-based incubator initiative for and by youth aims to be a positive space for exchange and concrete support for young Africans both in terms of skills and knowledge and in terms of entrepreneurship and job opportunities.
- **Novastar Ventures:** Novastar was founded to join and fuel an [entrepreneurial revolution](#) that is transforming markets and sectors in Africa. According to the founders, the Venture is collaborating with the brave for the benefit of people and the planet.

- **The Climate Innovation Center South Africa (CICSA)** provides business development support to start-ups in the [South African green economy](#) in collaboration with the World Bank's [InfoDev](#) and the Development Bank of Southern Africa (DBSA)'s green fund. The Center focuses on the energy, water, and waste sectors.
- **E3 Capital:** E3 Capital is a private equity fund investing in next-generation [smart infrastructure companies](#) in Africa. The organisation aims to create economic value for African economies and their investors without compromising sustainability. E3 Capital invests in climate-smart services, digital connectivity and applications, and solutions that make operations and consumer spending more efficient while leaving a low carbon footprint.
- **GSMA Innovation Fund for Climate Resilience and Adaptation:** On November 9, during the Science and Innovation Day at COP26, the GSMA announced the launch of the GSMA Innovation Fund for Climate Resilience and Adaptation (Steiner, 2022). This fund will help accelerate the testing, adoption, and scalability of digital innovations that enable the world's most vulnerable populations to adapt, anticipate, and absorb the negative impacts of climate change.
- The GSMA is a member of the Adaptation Research Alliance (ARA), a global collaborative effort to increase investment and capacity for action-oriented research to support effective adaptation to climate change.
- **The Energy and Environment Partnership Trust Fund (EEP Africa):** The Energy and Environment Partnership Trust Fund (EEP Africa) is a [clean energy financing facility](#) hosted and managed by the Nordic Development Fund (NDF) with funding from Austria, Finland, NDF, and Switzerland. It is guided by a vision for a climate-resilient, zero-carbon future with the aim of contributing to the achievement of the Paris Agreement on climate change and the Sustainable Development Goals (SDGs). It provides clean energy financing to early-stage projects in Southern and East Africa.
- **GIZ Accelerator Program for Climate Change Innovations:** Early-stage companies in Benin, Cameroon, and Niger that deliver digital solutions to combat climate change are supported by the GIZ Accelerator Program for Climate Change Innovations (Tim Steiner, 2022).

## Conclusion

Since the majority of the population in the developing world relies on micro, small, and medium-sized enterprises (MSMEs) for their livelihoods, it is imperative that this segment of the economy becomes more resilient to future climate impacts (United Nations Development Programme, 2016). At the same time, these businesses are well positioned to develop and sell products and services that strengthen the resilience of vulnerable communities. Africa should be carried along this global trend and must not be left behind because most of the projected future global economic growth is set to take place in developing countries (Ijeoma, 2015), of which Africa is very strategic, and allowing climate change to wash away these potential gains would be dangerous to the economic empowerment of millions of Africans who are already enduring climate change-induced crises.

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