Climate Adaptation Funding in Africa

The Role of Impact Assessment in Bridging the Gap

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Executive Summary

This report discusses the impact assessment challenges impeding investment in climate adaptation in Africa. It highlights key issues related to the funding gap, names barriers to defining and measuring adaptation impact, and recommends three actions to overcome measurement challenges.

There are two main challenges associated with investment in climate adaptation in Africa: insufficiency and inequity. First the funding gap for climate adaptation remains alarmingly insufficient overall, with a global financing gap of roughly $194-366B USD per year.¹ At the same time, the distribution of existing funding is severely inequitable. Despite the African continent contributing less than “4% of cumulative global energy-related CO₂ emissions, regardless of scenario,”²³ it faces the most climate change-related threats and receives a disproportionately small share of funding.⁴

The report then delves into the concept of climate adaptation and resilience, highlighting the inherent challenges in measuring their effectiveness. Unlike climate mitigation, which often involves quantifiable metrics, climate adaptation poses difficulties in assessment for both traditional and impact investors. Lack of comparability, the abundance of unknowns — especially due to the data gaps across the region — and the competing priorities between mitigation and adaptation all present challenges to quantification. Complexities

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arise from the dynamic and context-dependent nature of climate adaptation strategies and outcomes.

However, the impact case for climate adaptation aligns naturally with economic interests. Where measures for climate adaptation prove most impactful, governments, companies, and other potential purchasers will find them most valuable. In this way, the economic case for climate adaptation becomes more compelling, as it presents opportunities for sustainable growth, risk reduction, and improved resilience in the face of climate-related challenges.

Finally, given these nuances, this report concludes with a recommendation for improved data collection and application, which will contribute to helping public and private actors close the current gap in climate adaptation in Africa.
The Problem and Context

The threat of climate change is well-established as an increasing source of risk to economies, ecosystems, and livelihoods. Reports indicate investment in climate solutions stands at an all-time high globally, with $653B USD financed on average between 2019 and 2022. While $586B USD centered on mitigation efforts to reduce greenhouse gas (GHG) emissions — focusing mainly on renewable energy generation ($346B USD) and low carbon transport ($155B USD) in 2020 — only a small portion focused on climate adaptation ($66B on average between 2019 and 2020). This includes both adaptation-only activities as well as solutions with mixed benefits (adaptation and mitigation).

The continent of Africa, as a region, is reported to have received less than 6% of global climate-centered financing. Given that Africa accounts for less than 4% of global greenhouse emissions in 2019, this climate support may seem appropriate in a mitigation context. Sub-Saharan Africa as a whole emits .7MT of CO$_2$ per person per year on average. In comparison, the global average is 4.8MT of CO$_2$ and the United States average is 13MT of CO$_2$.

However, in an adaptation context, Africa faces a disproportionate share of negative effects of climate change induced by industrialized countries elsewhere in the world. The Intergovernmental Panel on Climate Change (IPCC) predicts global warming and rising sea levels that will disproportionately affect different regions, particularly in the 1.5ºC and 2ºC global average temperature warming scenarios. Similarly, the International Energy

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6 Ibid, p. 16.
Agency (IEA) predicts the earth temperature to increase by an average 2ºC by 2050, which would result in a 2.7ºC median temperature rise in Northern Africa. These risks are compounded across energy, food, and water in Africa and Asia and dramatically reduce economic growth across the African continent and other low-income regions. It's estimated that $52.7B in adaptation funding will be needed annually by 2030 to adapt to such climate-induced effects in Africa - $41.3B more than current annual commitments.

Defining and Differentiating Climate Adaptation

The United Nations Framework Convention on Climate Change (UNFCCC) defines climate adaptation as adjustments in ecological, social, or economic systems in response to actual or expected climatic stimuli and their effects. These adjustments could entail changes in processes, practices, and systems to moderate potential damages or to benefit from opportunities associated with climate change. Similarly, the IPCC defines adaptation as, “in human systems, the process of adjustment to actual or expected climate and its effects, in order to moderate harm or exploit beneficial opportunities.” In most policy and action, the focus remains on moderating harm or potential damages, as opposed to exploiting new benefits or opportunities in the face of a warming planet.

The terms adaptation and resilience often appear in combination and are sometimes used interchangeably. However, they are not the same. Resilience, as defined by the IPCC and others, refers more broadly to “the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or

improvement of its essential basic structures and functions.”  

Efforts include preventing contamination of water supply from sewage overflow.

In comparison, adaptation focuses on “making failure a rare and preventable event as long as plans and designs are followed and maintained.” Such failsafe efforts include creating storm walls or expanding the capacity of the water system to prevent flooding in the case of rising sea levels or increased precipitation.

Box 1: Dimensions of Climate Adaptation

Climate adaptation requires consideration along three dimensions of reduction: hazard, exposure, and vulnerability.

**Hazard**

Hazard refers to the first-order effects of GHG emissions — the change in climate itself. Hazard considerations could be rising temperatures, extreme heat, drought, rising sea levels, increased precipitation, and other environmental changes.

**Vulnerability**

Vulnerability refers to the sensitivity of communities, systems, and regions to a given hazard. For example, drought may lead to reduced crop yield or cause sustained disruption of the livelihood of farmer(s) and or entire agricultural sector(s). Solutions include drought-resistant seeds, climate-smart fertilizers to breed drought-resistant crops that reduce physical vulnerability, or insurance for farmers to reduce the impact on their incomes. Each solution mitigates various aspects of vulnerability for communities, systems, and regions in Africa.

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Exposure
Exposure refers to “the presence of people; livelihoods; environmental services and resources; infrastructure; or economic, social, or cultural assets in places that could be adversely affected.”  
This dimension focuses on being in harm’s way. Many island states, coastal communities, and ocean-based industries, for instance, have high exposure to rising sea levels. To clarify how this differs from vulnerability, both Singapore and Indonesia experience exposure to rising sea levels given their coastal natures. However, Singapore’s income and subsequent ability to adapt through expenditure on polders and dikes, building seawalls, and investing in more land reclamation reduces its vulnerability to sea level rise — to some extent.

Data and Assessment Challenges for Public and Private Investors in this Space
Through interviews with ten subject matter experts on climate adaptation finance, themes emerged around challenges faced by those who might wish to support solutions directed toward climate adaptation in Africa. These include lack of comparable impact measures, lack of historical data, and an increased level of uncertainty.

Lack of Comparability
One of the main challenges for investors in this space is understanding the impact of adaptation on climate-vulnerable populations and systems. While most climate mitigation solutions boil down to their impact on GHG emissions, climate adaptation must factor in different and many more variables.

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First, climate adaptation solutions vary depending on the type of hazard, and the nature of the potential harm. While some agencies attempt to quantify impact by metrics such as life years or economic value lost, there are no standards to compare measures across solutions. For example, a solution focused on rural smallholder farmers adapting to prolonged drought cannot be compared to urban infrastructure upgrades like buried power lines.

Moreover, regions experience climate impacts differently. Some cities face extreme heat, while others face flash floods. Other cities may experience both. Thus, solutions for adaptation in Lagos, Nigeria, will be vastly different from solutions for Addis Ababa, Ethiopia. When investing in a new technology to reduce the impact of or vulnerability to a specific climate change hazard, local population and market exposure limit the scalability of that solution. While climate mitigation can tackle entire industries or carbon-emitting processes across the globe, climate adaptation requires a market-specific approach.

Lack of Historical Proof Points

Investors face challenges with the lack of data and models that accurately predict the expected climate risks in Africa. Without these information points, difficulties persist to assess the size of the risk and identify solutions to reduce vulnerability or exposure. Data collection and analysis efforts focus primarily on the costs of global warming in the European Union (EU); however, missing data points continue for Africa, with costs often based on estimates.\textsuperscript{20} Moreover, the added components of socioeconomic and political instability create a recurring and compounding interaction with climate instability that make it difficult for impact investors and asset owners to mitigate and manage risk in the affected markets.

A different gap in historical data affects return-seeking traditional investors, who look for information about how comparable companies have grown in the past. Evidenced by

venture capital, of the 1206 unicorns globally, only 7 companies are based in Africa.\(^2\)\(^1\) One African company has gone public on the NYSE in the last 10 years.\(^2\)\(^2\) In 2021, none of the 33 reported African private equity exits took place through an initial public offering, which speaks to the lack of liquidity and range of exit opportunities available to most.\(^2\)\(^3\) In evaluating solutions that are specific to the African market, especially in the region-specific adaptation solutions, new investors have difficulty finding proof points for generating outsized returns given the existing perceived risk.

**Validated Opportunity Cost**

For most existing investors, whether climate-focused or Africa-focused, solutions for adaptation would require an evolution of their thesis. To invest in climate adaptation might then seem like a trade-off from investing in climate change mitigation that may reduce the effects of climate change. Moreover, even when outlining and calculating the stated benefits of climate mitigation with much more clarity, the opportunity cost may outweigh the perceived benefits of climate adaptation solutions. For instance, one may measure the efficacy of an adaptation solution in terms of economic impact. And while Africa’s emissions per capita is low today, projection may suggest emissions will increase without any intervention. In this framing, it may make sense for a firm to invest in hydro or solar technology that can power industrialization and contribute to economic development — rather than dikes or polders that reduce vulnerability by saving coastlines but have a more uncertain economic impact.

For those with the risk appetite of investing in climate adaptation solutions, the challenge may lie in perceptions of the total addressable market within Africa. For example, will investors see developers in Cairo as more desirable or valuable than developers in

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Amsterdam? When the spend and validated willingness to pay proves more likely in richer markets, how can African companies prove that there are customers in their markets?

Opportunity for Intervention: Climate Risk Measurement

Interviewees provided insights regarding potential solutions to the challenges described above. One clear opportunity for unlocking public and private investment arose from those insights: improved measurement of risk from climate damages could unlock significant investment in climate adaptation in Africa.

Box 2: Various Actors Experience this Measurement Challenge Differently

**Researchers and Experts**
Research organizations and experts, including universities, think tanks, public research organizations, or consortiums, focus on analyzing and understanding climate risks to different regions and markets. They publish papers, conceive and test solutions, serve as advisors and advocates to policies, and fundamentally serve the understanding of climate change, the risk it imposes across different markets, and potential solutions to reduce vulnerability. As a source of valuable data, knowledge, and justification to the system, these entities often represent the inception point for future market-ready solutions. However, to provide this value to the system, they require resources and funding.

**Founders and Solution Providers**
Founders and solution providers often provision adaptation efforts into the market. These entities include revenue-generating organizations that invent or deploy solutions to end customers. Within the system they require not only research to understand the problems, but funding and investment to build and commercialize their solutions for the market.
Box 2 Continued: Various Actors Experience this Measurement Challenge Differently

**Impact Investors**

Impact investors direct capital into organizations, funds, and projects intending to generate impact in addition to a financial return. They typically allocate capital based on both impact and financial metrics. Impact investors look to established and emerging research as well as employ market knowledge and financial analyses to construct investment theses which they raise capital for.

The Global Impact Investment Network (GIIN) estimates $1.1T USD in impact investing AUM worldwide in 2022.24 For scale, BCG estimates the global asset management industry to have over $100T USD AUM.25

**Traditional Investors**

“Traditional investors” direct capital into companies, organizations, and funds, with the intention of generating a financial return. These entities represent a significant source of capital for any profit-generating activity across the globe. Traditional investors vary by region, asset class, and many other dimensions. They provide liquidity and capital to the system and require enough data on risk mitigation to allocate capital confidently in solutions and ventures that provide value to customers with a willingness to pay in the market.

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Box 2 Continued: Various Actors Experience this Measurement Challenge Differently

**Private Customers**
Private customers include any private entity — individuals, corporations, small business owners, etc. — that find value in and spend money on solutions. Within the system, they benefit from understanding risk and establishing the business case for whether to pay to adapt to that risk and how to do so. For any given risk or hazard, businesses must decide how to react amongst a selection of options: Reinforce, Rebound, Retreat, Restrict, or Rebuild. An individual may decide whether to purchase drought-resistant seeds. A corporation may decide whether to reinforce its factory buildings against flooding. Their decision depends on their income availability, perception of risk, and other alternatives. In general, they require information and *dissemination* as well as accessible solutions to tap into.

**Governments**
Governments can play the same role as any of the other actors in the system. They can be researchers, founders, impact investors, and customers. Finally, they can serve as the payer for private customers, by offering subsidies and stipends to pay for solutions that individuals or businesses need to operate. But they often require funding and proof of capacity to properly deploy that funding.

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Impact Hypothesis: Improved Measurement will Accelerate Investment in Adaptation in Africa

As the diagram illustrates, accurate measurement of climate risk in Africa may contribute to unlocking the adaptation solutions needed to prepare for and react to climate risks. Further research is needed to substantiate this hypothesis.

Figure 1. Theory of change following an intervention to improve climate risk measurement in Africa
Measurement of climate risk requires three components: defining the metrics, establishing the baseline, and evaluating the solution.

**Defining the Metrics**
There remains a significant need to improve the definition of climate adaptation metrics. The Global Climate Observing Body (GCOS), an authoritative body focused on assessing the status of global climate observations, has repeatedly called for focus and improvements. Two challenges stand in the way. First, different categories of harm and hazards limit the comparability of metrics across locations; and secondly, it is difficult to assess the importance of different metrics as they relate to harm.

**Establishing the Baseline**
Understanding the status quo or expected harm of climate risk without any intervention requires knowledge of the probability of hazards increasing, harmful events, and the status quo adaptation practices employed over a set timeframe. Given the existing data gap to understand even present conditions, political and economic fragility compounds the challenges in estimating a baseline. Will flooding lead to more damage or will it lead to migration? What will migration lead to?

**Evaluating the Solution**
How might a potential solution reduce harm relative to the baseline? In addition to clarifying how we can accurately assess a solution’s impact, analysts must also take into account negative externalities, or rebound effects. For example, reinforcing buildings on the coastline could reduce vulnerability while increasing exposure as more people are willing to stay or move to exposed regions).

**Recommendations to Overcome Measurement Challenges**

1. **Invest in data solutions**
Investors at every level seeking resources from entities like the Green Climate Fund and the African Development Bank need better data sets to meet the criteria for securing funding. Governments, founders, impact investors, and traditional investors should invest
in university research and entities that capture and analyze data in climate-vulnerable areas to make their business case for funding support. Opportunities exist to commercialize this data into adaptive solutions, such as early warning systems.

2. **Accept multivariate assessments, but unify under human welfare scores**
   Climate adaptation remains highly location-specific, and a single metric will not capture the impact of either the climate hazard or a proposed solution. Resilience and vulnerability affect people at varying levels, and even those exposed to the same climate hazard may be affected differently by it. Data collectors can capture a portfolio of relevant metrics for a specific location to develop a weighted score of well-being.27

3. **Compare solutions across multi-variable efficacy and applicability over time**
   Impact and market-rate investors in adaptation solutions require multiple markets for product-market fit to build a durable business case to support end customers — states, developers, insurers, and companies — to minimize both the physical and welfare costs of climate hazards. Finally, actors in every arena should assess solutions not just against their ability to reduce or improve the defined metrics but over time to understand the benefits in the near term and long term.

**Conclusion**

The lack of data and agreed upon measurement techniques limits action. Instead, they more easily justify investing in deployment of readily available solutions as part of disaster recovery efforts and loss and damage. Traditional investors, who typically invest at the solution stage, remain too risk averse to solutions that appear early-stage, require substantial research, and situate in an already high-risk market. And more risk-accepting impact investors, do not have the capacity to solve this $50B USD challenge. Instead, this measurement gap requires funding so that adaptation solutions receive investment and deployment to help African markets adapt.

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Climate adaptation efforts must focus on capturing and analyzing data in climate-vulnerable regions across Africa. Efforts must focus not just on governments but a wide variety of entities. Data collectors must work to capture a portfolio of region-specific data metrics and match that information with weighted scores on well-being for that region. Data solutions require market focus with measurements for long-term benefits.

The impact case for climate adaptation mimics the economic case. Unlike climate mitigation where activists fought for years to convince businesses and countries to take on the mantle and work towards implementing non-financial incentives towards decarbonization, climate adaptation helps governments, businesses, and communities absorb the risk today. Solutions in climate adaptation have revenue, cost, and risk impacts in addition to existing ESG impacts. With corporate social responsibility and welfare focus in mind, adaptation investment are core to demonstrating impact in Africa’s development.

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