



Climate Innovation: Climate Smart Essential Services & The Opportunity for Philanthropy

The Climate Landscape Series

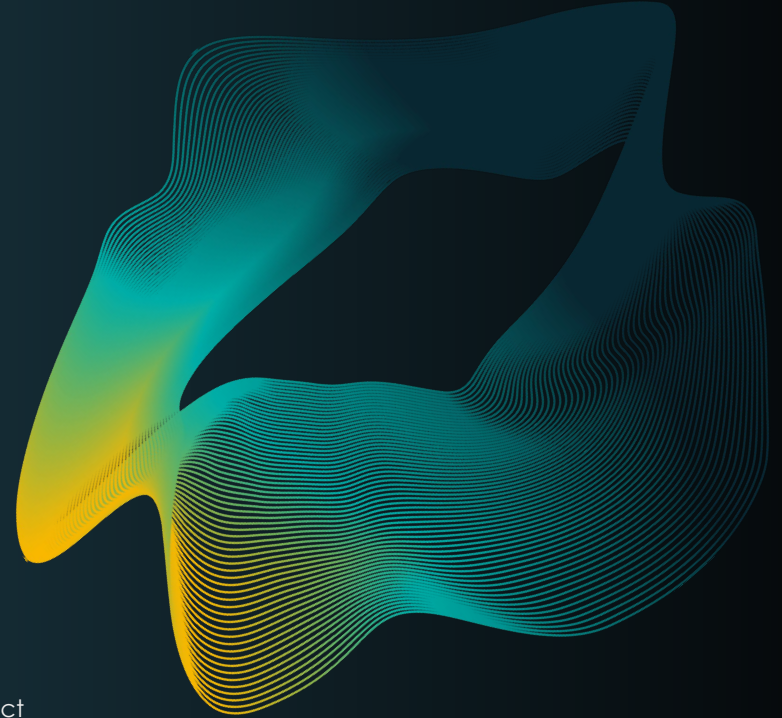
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Our Climate Landscape Series Decks

- **Conceptual Frameworks for Climate Action:** Climate Justice, Digital Finance and Climate Finance Flows
- **Climate Finance Taxonomies:** Frameworks for the current landscape
- Climate Change and **Gender**
- **Climate Innovation:** Climate Smart Essential Services & The Opportunity for Philanthropy
- **Climate Resilience Insurance:** Learnings, Gaps, Opportunities
- **Inclusive Climate Finance:** G2P Programs
- Building an **Inclusive Voluntary Carbon Market** for **Resilient Communities**
- **Climate Finance:** Data and Data Platforms



Climate Innovation: Climate Smart Essential Services & the Opportunity for Philanthropy

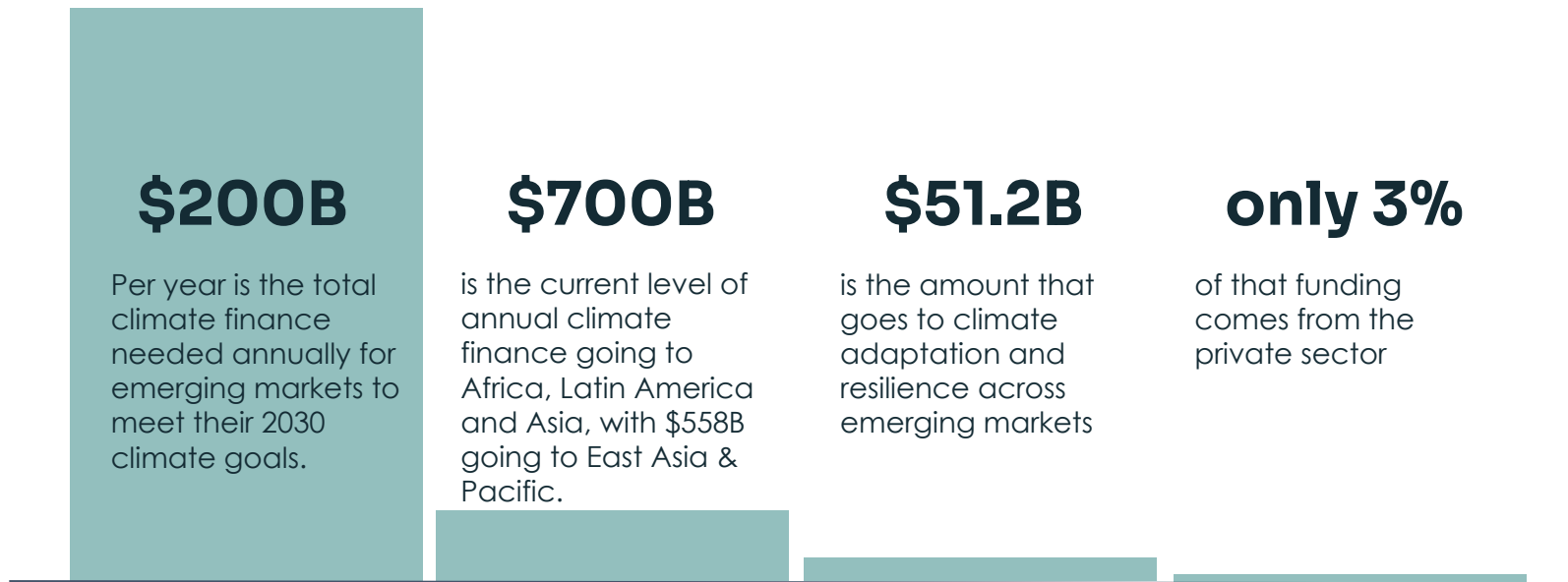
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Enablers of climate-smart innovation for resilience and adaptation:

1. Climate Smart Innovation Hub
2. Resilience+

Emerging markets urgently need to adapt to climate impacts. Yet, innovative solutions and funding for adaptation is nowhere close to meeting needs.



Source: CPI, Climate Finance Landscape 2023 and IMF



The ecosystem for adaptation and resilience solutions globally needs acceleration to reach the financing needed by 2030

Current barriers

Low knowledge



Little evidence on what adaptation solutions build resilience of vulnerable communities, and many innovators often don't self-identify as an adaptation entrepreneur.

Slow learning & ineffective coordination



Innovators solving problems on the ground are not learning systematically from each other to foster local innovation. They are also not well-connected to investors, policy makers, or corporates that can accelerate their journeys.

Limited pipeline of viable solutions



Innovators in climate resilience largely fall under the agricultural and renewable energy sectors and lack the sectoral diversity investors require for building strong portfolios. Innovators in other sectors are still too early for investment.

Difficult operating environment



Innovators face weak talent pools, low and slow funding sources, and failing infrastructure, limiting potential for scale.

Climate resilience innovations today are largely nascent. Those that exist can help communities manage climate disasters, adapt livelihoods and build long term resilience for people and for markets/infrastructure

Scalable innovative models exist but they often need philanthropic support in early stages to cover for R&D and longer test and learn periods.

Need	Solution areas	Startup Examples				
Manage disasters and shocks	Emergency credit and credit lines	 Cloud to Street	 Dorothy™	 acre AFRICA	 Hippo	 GRAMCOVER
	Insurance and data for pricing risk	 OKO	 LUMKANI SAFER TOGETHER	 tuifaco	 PULA	
	Remittances and payments					
Adapt livelihoods and essential services	Agriculture, fishery, pastoralism livelihoods 	 eFishery	 LENTERA AFRICA	 indigo™	 graviti	
	Water, Energy Access 			 gradient		
	Green Housing 					
	Waste Management 	 PharmEasy	 OLA ELECTRIC	 ReNew POWER	 Pristyn Care	
	Healthcare					

 signifies potential for mitigation benefits.

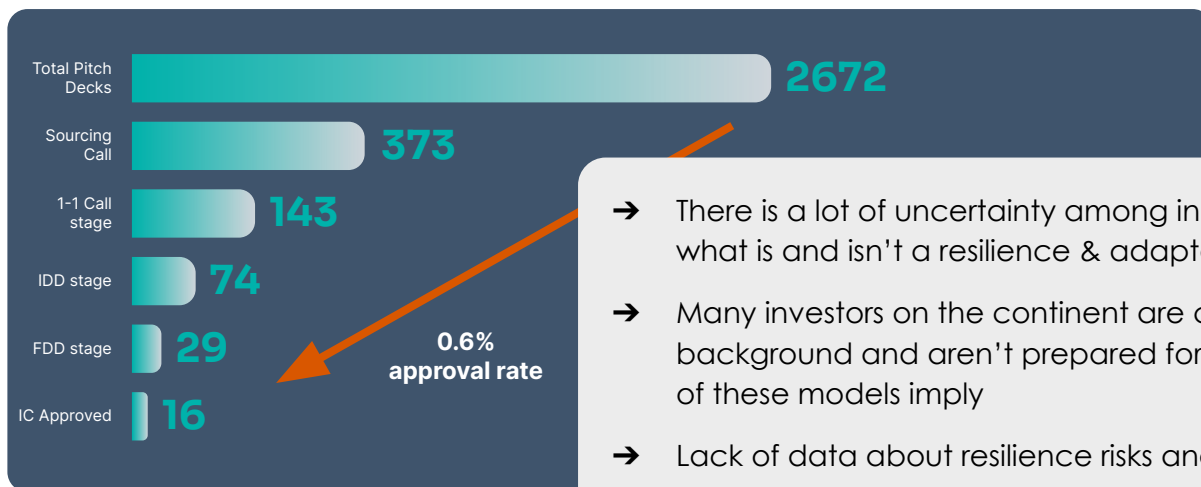


[Continued] Climate resilience innovations today are largely nascent. Those that exist can help communities manage climate disasters, adapt livelihoods and build long term resilience for people and for markets/infrastructure

Scalable innovative models exist but they often need philanthropic support in early stages to cover for R&D and longer test and learn periods.

Need	Solution areas	Startup Examples			
Build resilient markets and infrastructure	Information and data		 Blue Sky Analytics		
	Resilient infrastructure 	 BEYOND MEAT	 climeworks	 Pachama	
	Carbon markets 				
	Food systems 				

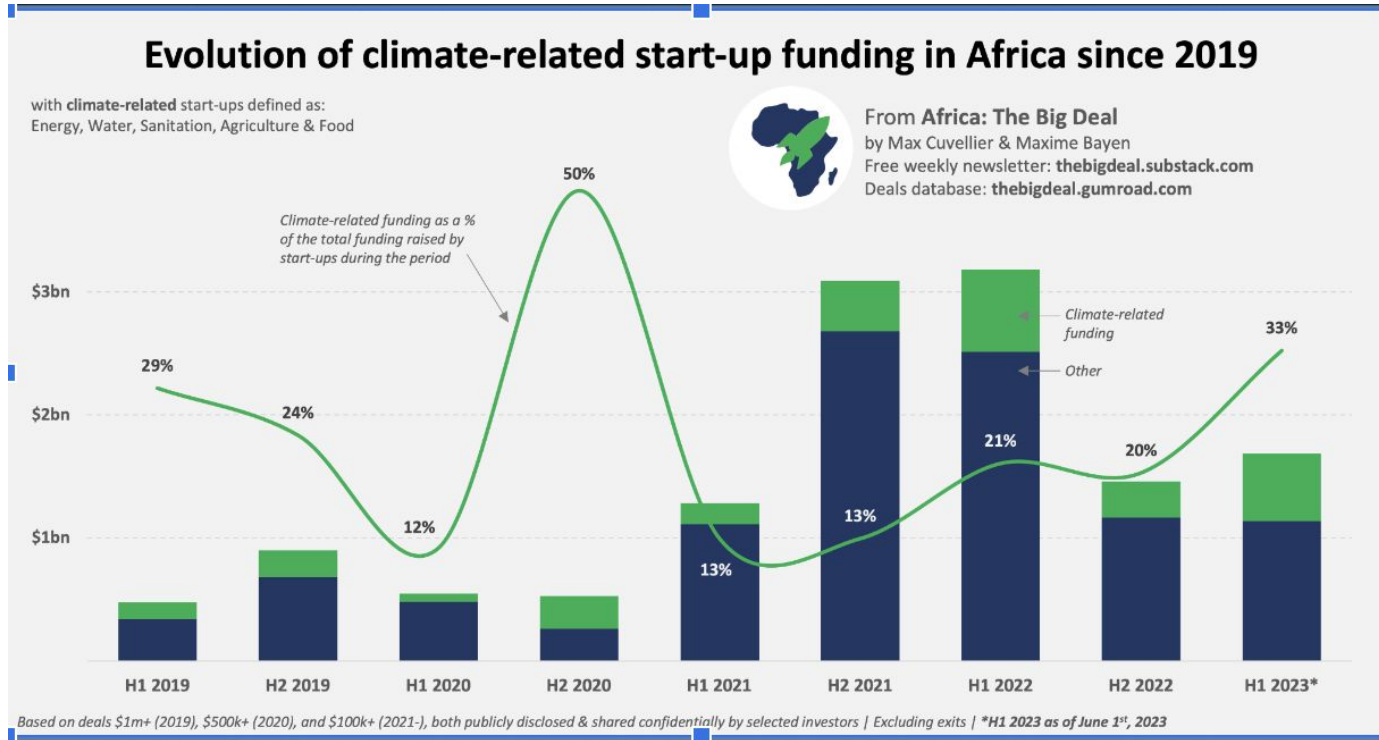
BFA Global through the Catalyst Climate Resilience Fund took a deep look at the pipeline of early-stage innovations in Africa and found consistent issues around definitions, lack of knowledge of climate models and lack of data that limit funding



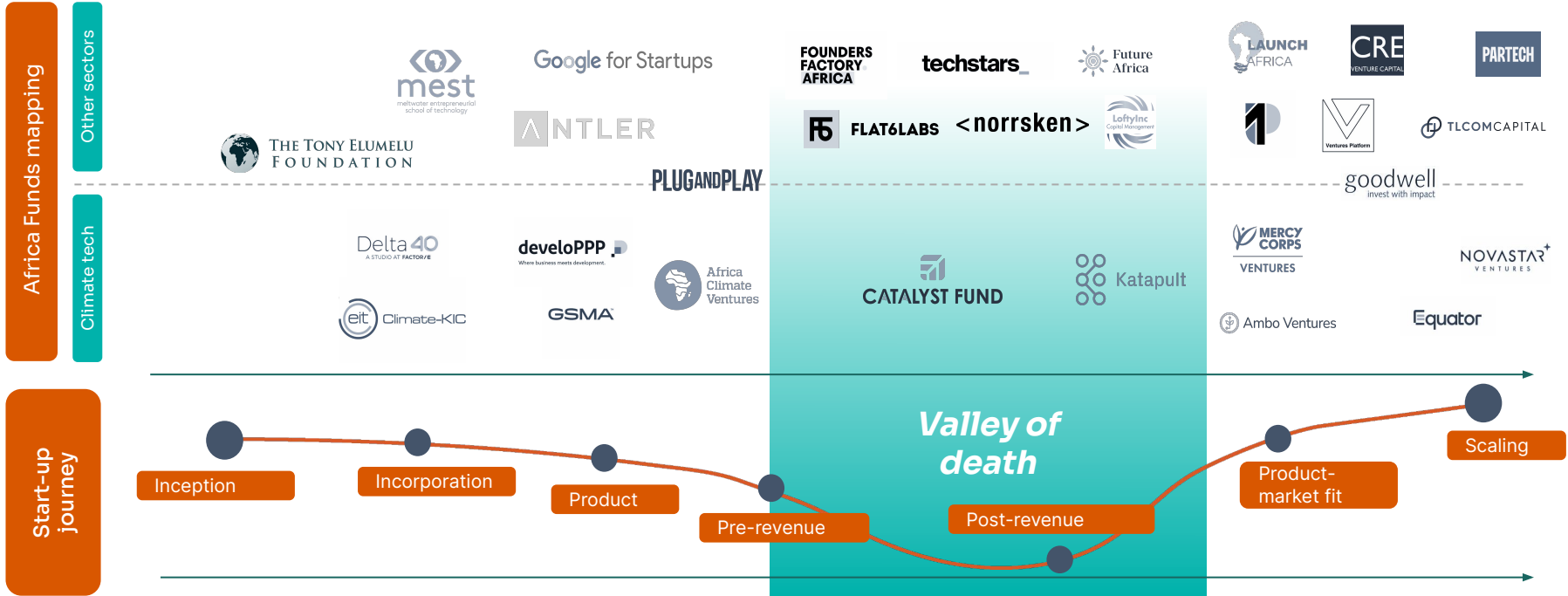
- There is a lot of uncertainty among innovators and even investors about what is and isn't a resilience & adaptation solution
- Many investors on the continent are coming from a tech/fintech background and aren't prepared for the capex investments that some of these models imply
- Lack of data about resilience risks and exposure adds further complexity

Definitional challenges may be creating a bias toward certain kinds of agtech and insurtech models

In addition, the report found that although climate startups in Africa are faring better relative to other sectors, they take longer to raise capital at early stages

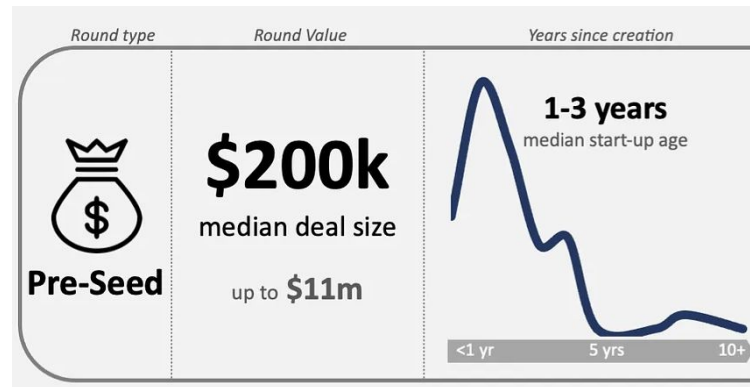
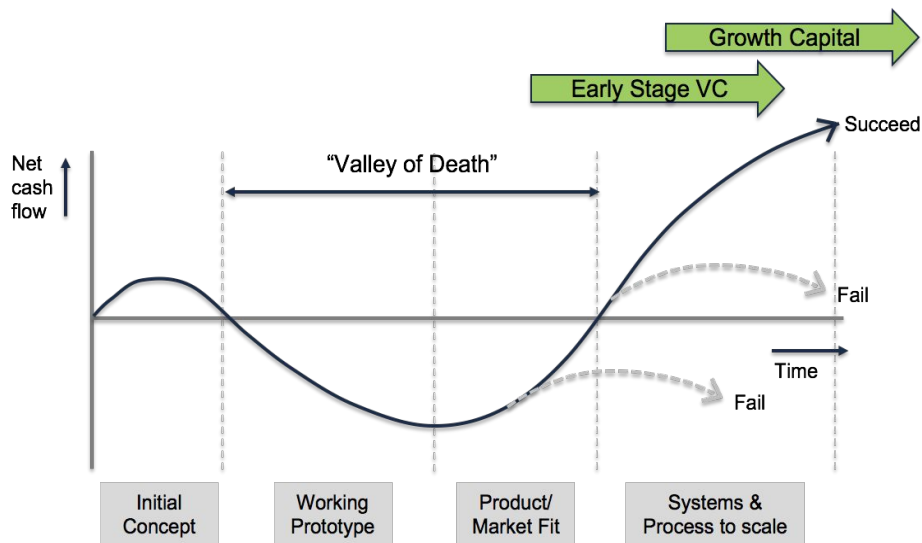


Startups face an acute funding gap at the pre-seed stage, when products are in market but still need to generate traction



There is an opportunity for patient, philanthropic capital to bolster the development of climate resilience solutions at the early stage of the cycle, to help them reach product-market fit

In Africa, climate tech startups take an additional year compared to other regions before raising a pre-seed round suggesting a need for more patient concessional capital



Source: Africa: The Big Deal





Climate Smart Essential Services: Examples of Climate Innovations

This section builds on the investment thesis of the Catalyst Climate Resilience Fund

Catalyst Fund's investment thesis focuses on three pillars of tech solutions that help communities manage climate risks, adapt livelihoods, and build long-term resilience

FINTECH for CLIMATE RESILIENCE



Insurtech

Carbon finance

Emergency payments

Climate risk and data solutions

Sustainable LIVELIHOODS



Climate-smart agtech

Fishery management & Aquaculture

Land restoration

Climate-smart ESSENTIAL SERVICES



Water management

Cooling / Cold storage

Sustainable energy access

Waste management

Healthcare

This thesis points to a specific set of solutions, each carefully selected for their role in building resilience among vulnerable people

THESES

FINTECH for Resilience



SOLUTIONS

Insurance
Carbon finance
Emergency payments
Climate data



RESILIENCE OUTCOMES

Households and users have access to range of financial services that build their financial health and allow them to cope with climate risks.

Sustainable **LIVELIHOODS**



Climate-smart agtech
Fishery management
Land restoration



Vulnerable people access and develop livelihoods that are adapted to climate change and its related effects.

Climate-smart **ESSENTIAL SERVICES**



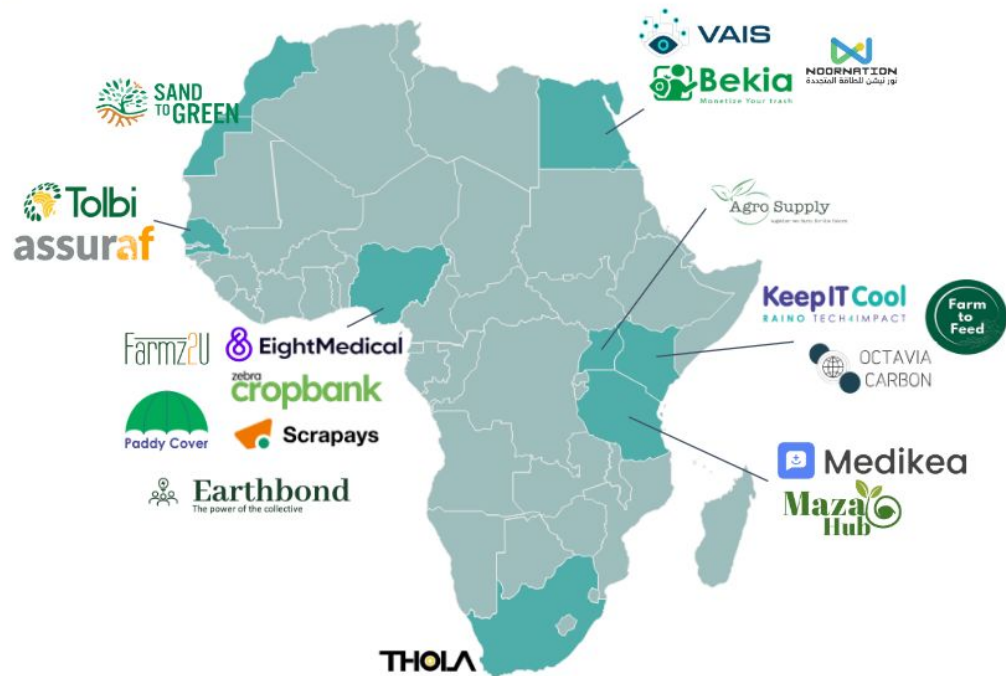
Water management
Cooling and Cold storage
Health
Waste management



Vulnerable people access essential services that are adapted to climate change and equip them to manage its impacts.



The fund's current portfolio comprises of 19 startups across 9 markets and 10 opportunity sectors for climate adaptation



The Catalyst Fund's portfolio companies are tackling urgent climate adaptation challenges across

- Agriculture (VAIS, Tolbi, Agro Supply, Farmz2U, Zebra CropBank, Maza Hub)
- Land Restoration (Sand to Green)
- Food systems (Farm to Feed, Thola)
- Carbon capture (Octavia Carbon)
- Healthcare (Eight Medical, Medikea)
- Insurance (Assuraf, Paddy Cover)
- Waste Management (Bekia, Scrapays)
- Cold Chain (KeepITCool)
- Water access (NoorNation)
- Energy access (Earthbond)



The Climate-Smart Essential Services vertical focuses on solutions communities need to manage climate change impacts like water scarcity, increasing temperatures, increased disease burdens, and pollution.

Opportunity Area	Description	Startup examples
Water Management	Water Management captures solutions responding to increasing variability of rainfall and increasing temperatures which are jointly increasing demand for irrigation, filtration, rainwater harvesting as well as sanitation solutions.	<ul style="list-style-type: none"> • Noor Nation (Egypt) • Sunculture (Kenya)
Cooling and Cold Storage	Cooling and Cold Storage captures tech and fintech innovations that can enable access to cooling and cold storage in response to increasing average temperatures and extreme heat.	<ul style="list-style-type: none"> • Keep It Cool (Kenya) • Kuza Freezer (South Africa) • ColdHubs (Nigeria)
Healthcare	Climate-smart Healthcare captures climate-risk-responsive health sector solutions like telemedicine, diagnostics, pharmacy services, and health financing linked to diseases that will worsen because of climate change (heat strokes, vector borne diseases etc)	<ul style="list-style-type: none"> • Eight Medical (Nigeria) • Medikea (Tanzania)
Waste Management	Waste Management captures solutions like waste-to-energy, recycling, and composting, which aim to reduce the nexus of climate risks like flooding and poor waste management.	<ul style="list-style-type: none"> • Scrapays (Nigeria) • Bekia (Egypt)



Climate-smart essential services - Water management

- Climate change is creating [a water crisis](#) through a variety of impacts: floods, unpredictable rainfall, rising sea levels, shrinking ice fields, wildfires, droughts, and more.
- These direct impacts are creating water stress; [by 2050 around half the population and global GDP](#) will be at risk due to water stress.
- In Africa, these problems are acute: high water stress will [affect about 250 million and displace up to 700 million people by 2030](#).
- Current solutions have generally failed to scale, most enterprises serve around 200,000. Low scale is a result of low affordability, accessibility and appropriateness.



Source: Siemens Stiftung /Georgina Goodwin

Climate-smart essential services- Water management

TABLE 1. Challenges Addressed in Fintech Use Cases

Challenge	Use cases
Helping urban households manage up-front costs of water and sanitation	<ul style="list-style-type: none">• Savings to reduce high up-front costs• Financing to reduce high up-front costs• Enhanced savings tools for water and sanitation• Subsidies for water and sanitation using blockchain
Urban water and sanitation provision by utilities	<ul style="list-style-type: none">• PAYG to address payment risk and expand access• Utility payments via mobile money• Enhanced payment options for prepaid standpipes• Linking utilities and credit data to reduce risk
Urban water and sanitation provision by small-scale service providers	<ul style="list-style-type: none">• Simplified accounting and billing for efficiency and creditworthiness• PAYG to ensure water revenue collection and network maintenance• PAYG for household sanitation
Smallholder irrigation	<ul style="list-style-type: none">• PAYG shutoff financing models to reduce up-front equipment costs• Rural-focused commitment savings to cover equipment costs• Credit scoring for farmers—alternative data and IoT irrigation• PAYG water for irrigation• New water usage management and conservation schemes• Marketplace platforms with irrigation integration

Note: PAYG = pay-as-you-go.

- **Fintech-enabled savings, credit, and PAYGo models can help scale startups offering irrigation systems, cisterns, water pumps, and rainwater harvesting systems, all powered by renewable energy.**
- Such technologies can also help governments and other programs to target subsidies and transfers in support of such purchases, given the positive externalities of appropriate water management. In addition, fintech can improve utility management and bill payment.
- The World Bank consolidated a list of fintech applications for water access in their publication [Fintech for the water sector](#).



Climate-smart essential services - cooling and cold storage

- [UNEP reports](#) that “**Up to 40% of food is lost between farms and markets in sub-Saharan Africa**, with two-thirds of this in the first mile”. This wastage persists even as [20% of Africans](#) are hungry and the farmers who produce that food face low and unpredictable incomes.
- In the case of heatwaves, what was a once-in-a-decade event will now take place nearly [three times](#) as often. Between now and 2050, an additional [€235 billion](#) of investments and operational expenses in power generation and transmission are needed to provide the additional electricity needed for cooling. In Africa, [470 million in rural areas lack refrigeration and 630 million in urban areas lack cooling](#).
- Building **cold chains for storage of food produce across value chains** will not only shore up food security, but also improve incomes for vulnerable farmers by up to [50%](#).



Climate-smart essential services - cooling and cold storage

- **Fintech technologies have already proven to expand access to assets powered by renewable energy, for example PAYGo solar, which claims to have reached between 25 and 30 million people, according to GOGLA, the association for the off-grid solar industry.**
- Several startups have started leveraging tech and fintech innovation to enable access to renewable energy powered cold chain solutions. They are also leveraging fintech to increase affordability such as in Pay-As-You-Store models, leveraging digital payments, remote switches, digital wallets and more.
- For example, **Koolboks employs a pay-as-you-go model** that enables individuals and small businesses, such as fish dealers, to pay \$10 to \$20 monthly to own one of its 110–1,000 liter-sized off-grid solar refrigerators. They make payments through their mobile phones or a POS agent close to their shops; they get tokens entered as codes into the fridge, proceeding to use it for a certain period.



Cold Storage Startup Highlight

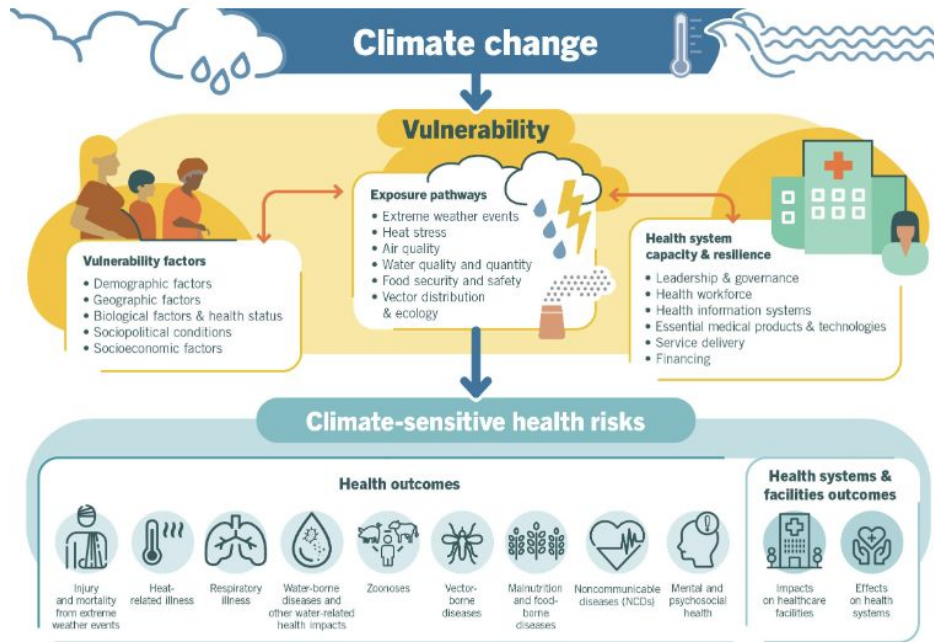
Cold Hubs

ColdHubs are plug-and-play modular, solar-powered walk-in cold rooms that provide 24/7 off-grid cold storage and preservation. They address the problem of post-harvest losses of fruits, vegetables, and perishable foods among smallholder farmers by:

- Providing cold storage on a pay-as-you-go basis
- Offering logistics and transport services to farmers
- Facilitating marketplace access for retailers and wholesalers

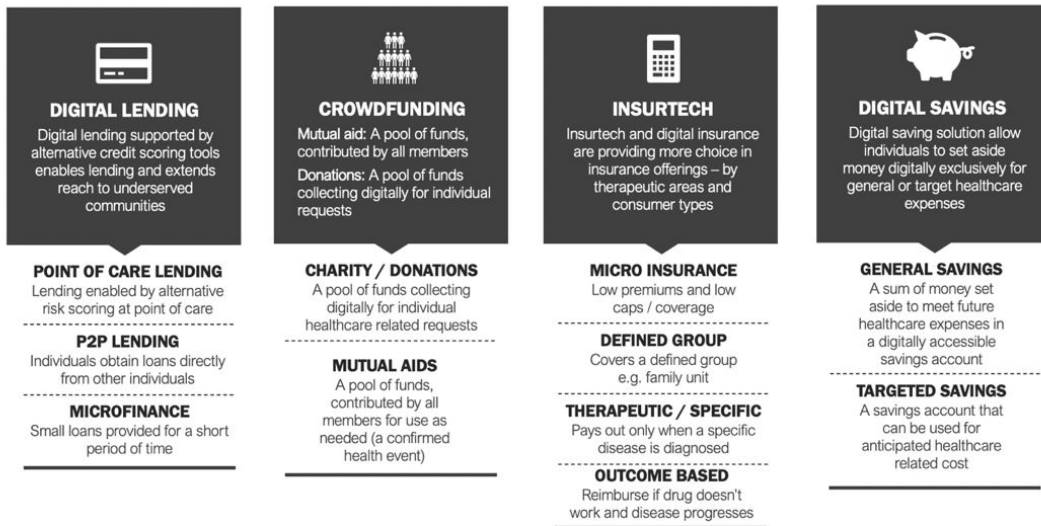


Climate-smart essential services: Healthcare



- The WHO estimates that between 2030 and 2050, approximately [250,000 deaths](#) per year from malnutrition, malaria, diarrhea, and heat stress. In Africa, [56% of public health events recorded between 2001 and 2021 were climate-related, with 25% more events recorded between 2011 and 2021](#).
- Already, diarrhoeal disease is the [third leading cause](#) of disease and death among children under five, a number that will only increase as risk of diarrhea increases. The WHO also notes that vector-borne diseases, notably yellow fever, as well as malaria, are on the rise and are dire climate-related health emergencies.

Fintech solutions and enablers have proven invaluable in unlocking access to health solutions



- **Vulnerable people in Africa need a range of healthcare solutions** from emergency medical care, diagnostic solutions, health savings accounts, remote treatment/diagnostics, and health insurance.
- While typically many healthcare solutions would be provided by the public sector, there is a vast opportunity for **private sector and tech startups to fill gaps** and provide healthcare solutions.
- Health financing mechanisms can be accessible to low-income populations thanks to **digital wallets, digital ID solutions, digital payments**, and a range of other fintech enablers.

Credit: ACCESS Health International Southeast Asia, "Fintech for Health Taxonomy of Fintech Solutions for Healthcare"



EightMedical

- EightMedical operates in Nigeria where key climate risks such as increasing average temperatures and frequency and severity of heatwaves as well as more extreme rainfall and floods will have a dire impact on the health of individuals. **24 percent of Nigerians live in high climate exposure areas.**
- **EightMedical is a cloud-native Emergency Medical Services (EMS) platform that provides on-demand urgent care when and where it is needed.** This “911 for Africa” connects emergency medical responders on motorcycles to users in distress in 10 minutes or less.
- To date, EightMedical has offered EMS response to a variety of **climate related health emergencies** including accidents linked to heavy rains/floods, buildings collapsing (linked to heavy rains), and car accidents.



Source (image): <https://www.8medical.co/>



Climate-smart essential service: Waste management

- With 2 billion people lacking access to solid waste collection services and 3 billion relying on open dumpsites globally, there is a significant market for innovative waste management solutions that can improve public health, reduce environmental pollution, and create jobs.
- As waste generation is expected to increase by more than three times by 2050, the need for effective waste management solutions will only continue to grow. Furthermore, uncollected or open-dumped waste is a major source of greenhouse gas (GHG) emissions, which will account for 8-10% of global GHG emissions by 2025.
- Similarly to enabling access to other essential services, fintech innovations such as **digital payment wallets** or **insurance** can ease access of these solutions among vulnerable communities.



Source: Wearetech.Africa

Startup Highlight - Waste Management



- Nigeria faces a waste disposal problem, with an **estimated 32 million tonnes of solid waste produced annually**. The lack of proper waste management leads to environmental pollution, sewage issues, and health risks. However, the disposal challenge also presents an opportunity for waste management companies to scale their operations, creating job opportunities and improved livelihoods.
- **Scrapays** offer recycling as a business service where anybody can start and grow their mini recycling business.
- A USSD application and WhatsApp bot (offline and low internet solution) connects waste producers to waste collectors so they can come pick up waste directly at their location.
- These services are integrated with a digital wallet to receive payments and an IoT enabled weighing tool that tells the agent how much the waste is worth.



Key Insights

- **Technology and business model innovation** has the potential to greatly increase access to essential services that will be affected by climate change in many countries, and particularly in Africa.
- **Water solutions, cooling and cold storage, waste management, and healthcare** are all essential services that must be accessible to vulnerable communities, especially as climate change worsens.
- **Fintech solutions** from digital insurance, to digital payments or credit have the **potential to lower the cost of access** for such solutions for vulnerable communities.



[Find out more about the investment theses of Catalyst Climate Resilience Fund](#)





Enabling Climate Smart Innovation through CSIH and Resilience+

This section builds on the experience of two programs that BFA Global managers, CSIH and Resilience+

Climate Smart Innovation Hub - CSIH Gallery of Products

Our [CSIH Website](#) is a space where you will find information about our work and efforts, one of which is the gallery of products. It is a space where you can access information about various climate-related products.

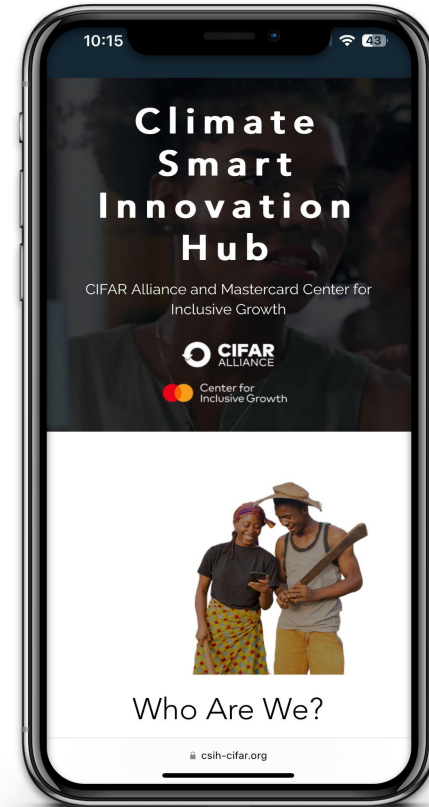
Additionally, we have dedicated significant effort to identifying products related to financial services, both for adaptation and mitigation.

The primary objective of this space is to facilitate product comparisons and highlight the most prominent ones based on the user's interests.

BFA GLOBAL



Center for Inclusive Growth



Gallery of Products

We have categorized the products based on the financial services they offer, their focus on climate resilience, climate impact, geography, and business model, among other factors.

Some examples of these products include:



AgDevCo

AgDevCo provides businesses with technical assistance to succeed while maximizing **impact in gender equity, climate resilience, and smallholder development.**



APOLLO
AGRICULTURE

Apollo funds farmers for better products, **increased yields, and transitioning to commercial agriculture.** Cash or credit options available for purchasing inputs.






Bancamía
Facilitamos su progreso

Bancamía offers green credit with reduced rates for **climate practices & tech to farmers** & microentrepreneurs. They also provide **climate insurance & rural savings products.**

Report: Fintech for Climate Resilience: A compendium of startup innovations building resilience in emerging markets

This [report](#) by the [CIFAR Alliance](#) Investors Working Group highlights 11 successful ventures that are building solutions to improve the resilience of communities susceptible to climate change. The Alliance members, including [Catalyst Fund](#), [Mercy Corps Ventures](#), [British International Investments \(BII\)](#), [FSD Africa](#), [Gawa Capital](#), [MSC](#), [Omnivore](#), and [IUCN](#), illustrate how fintech can deliver scalable climate resilience solutions.

	Data and Digital infrastructure	Online marketplaces	Insurtech
Weather-related disasters	FLOODBASE		
Long-run climate changes threatening livelihoods		 	
	  	 	
			



Resilience+ Innovation Facility

Alternative indexed financial tools can overcome some limitations of index insurance



Source: [UC Davis MRR Innovation Lab](#)

- Agricultural index insurance has been shown to provide needed support in the event of a shock as well as to unlock investments for greater productivity and income. However, sustained adoption has been a challenge.
- **The University of California Davis has partnered with Bill & Melinda Gates Foundation and BFA Global** to deploy alternative financial instruments that can leverage the same index to fill some of the gaps left by insurance. The blend of these three indexed financial instruments makes it possible for small-scale farmers to dynamically manage their risk over time.



Resilience+ Innovation Facility

Alternative indexed financial tools can overcome some limitations of index insurance

Agricultural Index Insurance (II)	<p>For the cost of an insurance premium paid in advance, II releases payouts if the underlying index predicts crop losses.</p> <ul style="list-style-type: none">• Includes leverage: a small pre-paid amount unlocks a large future amount.• Requires trust in the index and cash for premiums.
Contingent Savings Account (CSA)	<p>A farmer can use a CSA to save money more safely with the promise of receiving interest if the underlying index predicts crop losses.</p> <ul style="list-style-type: none">• No leverage: only gives access to the amount saved plus interest in an emergency• Requires cash.
Contingent Line of Credit (CLOC)	<p>Farmers who are pre-approved for a CLOC receive a loan in the event that the underlying index predicts crop losses.</p> <ul style="list-style-type: none">• Includes leverage: zero up-front cost to unlock a large amount in an emergency.• Requires creditworthiness.



BRAC Emergency Credit: A New Type of Indexed Loan to Address Smallholder Risk



Financial service providers (FSPs) often withhold credit from borrowers who have suffered an income shock because they are concerned about default risk. Without safety nets clients are forced into costly coping strategies – reducing consumption, pulling children out of school, selling assets, etc. The traditional lending strategy by FSPs to link credit access to income is a missed opportunity to build resilience.



In Bangladesh, **BRAC provided pre-approved households a line of credit in the event of a flood disaster.** This new type of loan, or “Emergency Loan” initiated liquidity for rice farmers when a flood index was triggered. The Emergency Loan provided up to 50% of the principal amount of a client's last regularly approved loan. A randomized controlled trial showed that **the Emergency Loan generated similar benefits of agricultural index insurance with the potential to quickly scale** through existing MFI operations.

Resilience: For smallholders experiencing a flood, the Emergency Loan provided needed to maintain consumption and continue farming practices.

Productivity Boost: With the knowledge that they had access to this risk management solution, treatment group farmers invested more in their farms. Pre-approval for the loan generated increased investments in food production by 15% and an 9% increase in consumption.

Business Case for the FSP: The Emergency Loan had overall repayment rates that were nearly identical to conventional microfinance loans, net revenues were 4% higher for BRAC branches that made the Emergency Loan available.



Additional resources

[CIFAR's Climate Smart Innovation Hub and the Gallery of Products.](#)

[CIFAR Climate venture Working Group: **Fintech for Climate Resilience: A compendium of startup innovations building resilience in emerging markets**](#)





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Thank you!

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