CLIMATE INDUSTRY SPOTLIGHTS

Seeding the Future: Climate Technology, AgriFood Entrepreneurship, and Ecosystem Growth in Africa

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Introduction

Africa's agrifood sector stands at a critical intersection of climate vulnerability and economic opportunity. With climate change threatening agricultural productivity across the continent, innovative climate technologies are emerging as vital tools for building resilience while creating sustainable business models. This brief presents current trends in climate tech adoption within Africa's agrifood sector, highlighting key innovations, financing patterns, and policy implications. As climate change intensifies, so too does the urgency for ventures to innovate, adapt, and scale sustainable solutions. For ventures at the Ghana Climate Innovation Centre (GCIC), staying informed about the latest sector-specific trends, novel technologies, and regionally relevant policies is key to remaining competitive and impactful.

According to the African Development Bank, agriculture employs over 60% of Africa's workforce and contributes approximately one-third of the continent's GDP. This highlights the sector's pivotal role in Africa's economy and its potential for driving inclusive growth (African Development Bank, 2023). Despite this significance, the sector has historically operated below its potential, facing multiple interconnected challenges that have limited its productivity and impact on food security. These persistent challenges have created both a need and an opportunity for innovative approaches to agricultural development, particularly through entrepreneurship.

Unlocking Africa's Agrifood Potential: Addressing Challenges and Realizing Opportunities

The continent possesses over 60% of the world's uncultivated arable land yet paradoxically suffers from low agricultural productivity compared to global averages (African Development Bank, 2024). This productivity gap is not only a reflection of inefficient land use but also exacerbates food insecurity across the continent, with an estimated 650 million Africans lacking access to sufficient food (FAO, 2020). Climate change further compounds these challenges, as increasingly frequent droughts, floods, and unpredictable weather patterns disrupt growing seasons and reduce yields. Additionally, inadequate infrastructure including poor road networks, limited storage facilities, and constrained market access which are prevalent in the sub-region hampers efficient distribution of agricultural products from farm to market, leading to significant post-harvest losses, productivity and food security issues.

Entrepreneurs in Ghana's agrifood sector are no longer limited to traditional tools. Cutting-edge solutions like precision agriculture,IoT-powered soil and water sensors, and drone mapping are now affordable and game-changing. These technologies help reduce input waste, boost crop yields, and provide early warnings about weather shifts which are crucial elements in our changing climate.

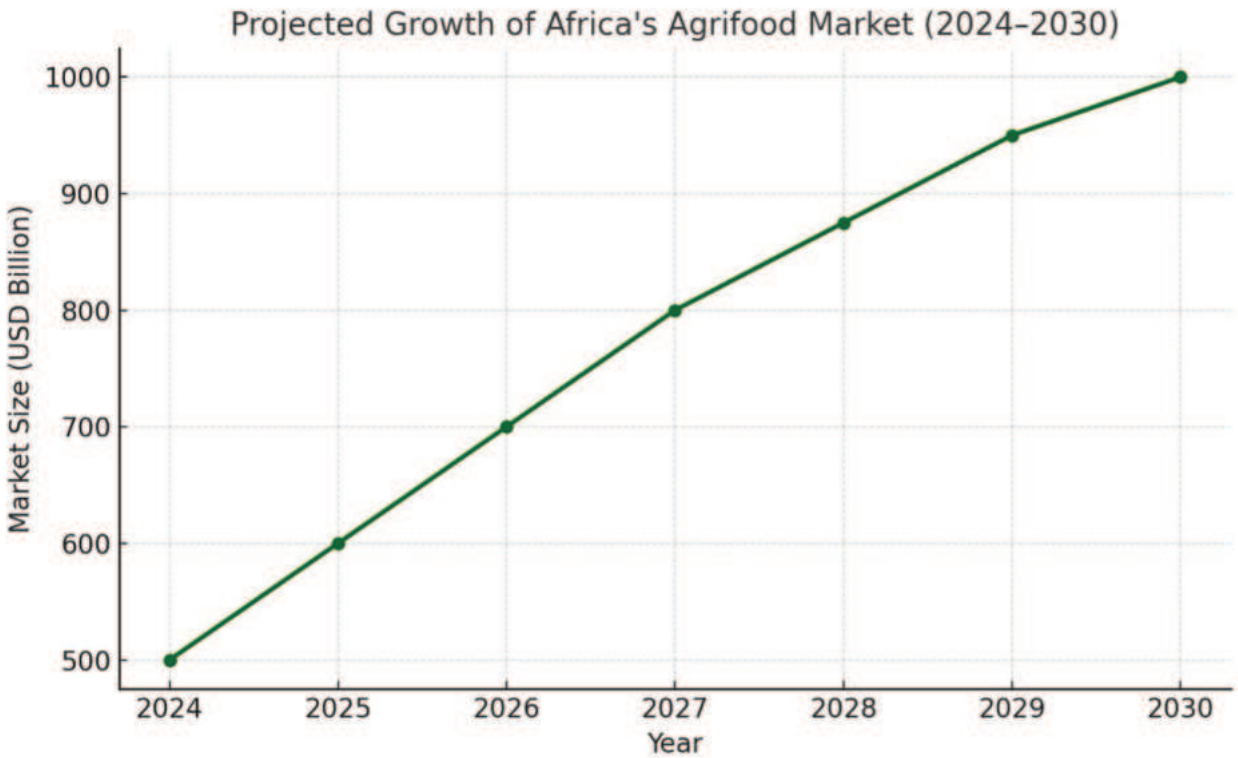
Take Grow For Me, for instance. This Ghanaian agri-tech startup uses satellite imagery and AI to monitor farm conditions in real time. Farmers receive localized weather alerts and practical tips on when to plant, irrigate, or harvest. This kind of precision saves time, money, and resources while increasing output.

There are major innovations in the area of post-harvest management which is a common pain point too. Solar-powered dryers and cold storage units are slashing food loss. One example is Koolboks, which has introduced walk-in solar cold rooms in peri-urban areas. These units can keep produce fresh for up to 5 days without grid electricity, offering entrepreneurs a chance to maintain quality and reach markets farther afield.

This matters now more than ever because entrepreneurs who adopt these tools are not only reducing their costs and increasing their productivity but are gaining a serious competitive edge. Instead of guessing when to irrigate or harvest, they make data-driven decisions. Instead of watching produce spoil in the sun, they are extending shelf life and reaching new buyers. And by plugging into innovation hubs like GCIC, ventures can gain access to pilot funding, technical partnerships, and new markets. These are not abstract possibilities. They are concrete, proven advantages already being leveraged by peers in the ecosystem.

Africa's agricultural landscape is undergoing a bold transformation, fueled by the rise of agri-entrepreneurship where innovation, sustainability, and business acumen intersect to reshape farming. This shift goes beyond improving food production; it's about building scalable, profitable, and climate-resilient agribusinesses.

Figure 1.0
Africa's Agrifood Market Size Projections (2024–2030)



Source: African Development Bank (2023); International Finance Corporation (2022)

As illustrated in the chart above, Africa's agrifood sector holds immense potential According to the African Development Bank (2023), Africa's agrifood sector is projected to hit $1 trillion by 2030, while the International Finance Corporation (2022) anticipates that agribusinesses could generate over 100 million jobs within the same period. This makes agri-entrepreneurship not just a growth market, but a strategic pathway to job creation, food security, and economic empowerment across the continent.

Climate technologies are playing a central role in this transformation

As described by FAO & UNFCCC (2024), these technologies encompass not just equipment and products, but also techniques, practices, practical knowledge, and skills, supported by appropriate processes and institutional frameworks. They serve as essential enablers for both adaptation to climate change and reduction of greenhouse gas emissions throughout agrifood systems. Organizations like the Food and Agriculture Organization (FAO) and the Alliance for a Green Revolution in Africa (AGRA) have been actively promoting entrepreneurial approaches to farming, providing much-needed support and resources to young farmers eager to innovate. This support takes various forms, including funding and investment, technical assistance, knowledge transfer, market access facilitation, networking opportunities, and policy advocacy.

Climate technologies are not just reshaping industries. They are being driven by bold, homegrown ventures that are proving innovation is possible and profitable in Sub-Saharan Africa. ShaQ Express for example, started as a last-mile delivery company and is now leading the charge in sustainable logistics. By introducing electric motorcycles, piloting battery-swapping stations, and integrating real-time data systems that connect with the Ghana's Driver Vehicle and Licensing Authority (DVLA), ShaQ Express is optimizing delivery efficiency while cutting emissions, demonstrating how digital systems and green transport can go hand in hand. Similarly, Wahu Mobility is transforming clean mobility by deploying battery-powered cargo bikes tailored for short-haul logistics. By leveraging bulk import agreements and flexible financing models, they are making battery technology more affordable for SMEs operating in the agrifood and healthcare delivery sectors. Their model shows how climate tech can unlock access for underserved business segments.

In agriculture, Grow For Me is scaling climate resilience through innovation. Beyond its crowd-farming roots, the venture now promotes climate-resilient crops and works with farmer cooperatives to adopt regenerative practices like conservation tillage and crop rotation. These methods not only restore soil health but also protect yields against unpredictable weather, proving that smallholder farming can be both climate-smart and commercially viable.

These ventures are not outliers. They are examples of what's possible when climate technologies are integrated with clear business models. The message is simple: innovation in climate technology is already happening in Sub-Saharan Africa, and other entrepreneurs can build on this momentum.

Landscape of Climate Tech in African Agrifood Systems

Africa faces significant challenges related to climate change, with agriculture being particularly vulnerable. Climate technologies represent an essential means to accelerate needed progress on adaptation and build structural resilience into agrifood systems (FAO & UNFCCC, 2024). Climate technologies encompass equipment and products, techniques, practices, practical knowledge and skills, in the context of the processes and institutional frameworks required for uptake (FAO & UNFCCC, 2024).

The financing landscape for climate technologies in agrifood systems remains critically underfunded, impeding the sector's ability to implement climate-smart innovations at scale. According to data analyzed by FAO & UNFCCC (2024), only 4.3% of global climate finance tracked at the project level was allocated to agrifood systems in 2019/2020. This share significantly dropped to just 1% when focusing solely on adaptation finance. This stark underinvestment highlights a substantial financing gap, limiting the sector's capacity to drive the transformation necessary for sustainable agricultural development and climate resilience.

Several entrepreneurial models demonstrate the potential for climate technologies to transform African agriculture:

1. Climate-Smart Agriculture Technologies: Across Africa, climate-smart agriculture techniques like crop diversification, improved soil management, and conservation agriculture are helping farmers adapt to climate change while contributing to mitigation efforts. For example, ventures like AgriProtein in South Africa, which converts waste into animal feed, and One Acre Fund in Kenya, which provides farmers with climate-resilient crops, are driving sustainable agriculture. Additionally, initiatives such as Tingo Inc. in Nigeria, which connects farmers to digital platforms, are enhancing productivity and reducing climate risks. These ventures demonstrate the potential of climate-smart solutions to address both environmental and economic challenges in Africa (FAO & UNFCCC, 2024; World Bank, 2023; United Nations, 2022).

2. Water Management Innovations: Water scarcity is a major challenge in many African regions, creating opportunities for entrepreneurs to implement technologies like drip irrigation, water harvesting systems, and treated wastewater solutions. For instance, ventures like Sahara Irrigation in Morocco and WaterGen in Kenya are using innovative technologies to enhance water-use efficiency in agriculture and improve resilience to droughts (FAO & UNFCCC, 2024; World Bank, 2023; United Nations, 2022).

3. Protected Cultivation Systems: In climate-vulnerable regions, protected cultivation systems such as greenhouses and tunnels help shield crops from extreme weather events, extending growing seasons and improving yield stability. These systems have shown success in various African contexts, enhancing resilience to climate variability (FAO & UNFCCC, 2024). In Ghana, Urban farming is rapidly growing in Accra and Kumasi through innovations like vertical farming, hydroponics, and rooftop gardens. These are solutions that address limited land and rising food demand. For example, Eden Farms is piloting aquaponics systems that recycle fish waste into nutrients for plants, creating a closed-loop system that conserves water and maximizes space efficiency.

4. Agroforestry Solutions: Indigenous agroforestry systems, like the Faidherbia Parklands in Senegal, are gaining recognition for their role in climate adaptation. These systems offer multiple benefits, including nutrient cycling, erosion control, microclimate regulation, and enhanced long-term food security (FAO & UNFCCC, 2024; World Agroforestry, 2023).

Farming

Financial Innovation and Access

Access to appropriate financing is a key barrier to the widespread adoption of climate technologies in Africa's agrifood systems. According to FAO & UNFCCC (2024), adaptation finance dominates climate-related development flows, receiving 51% of funding, compared to 23% for mitigation and 26% for cross-cutting initiatives. This distribution highlights the pressing adaptation needs in Africa's agrifood sector.

Sector-specific data shows that 80% of climate finance for food security projects targets adaptation, while mitigation receives only 9%. Similar patterns emerge in agriculture and fisheries, with 71% and 68% of funds allocated to adaptation, respectively (FAO & UNFCCC, 2024).

Geographically, Asia receives the largest share of agrifood-related climate finance (36%), followed by Africa at 29%. This underscores the need for increased investment in Africa, where climate vulnerabilities remain significant despite substantial attention (Climate Policy Initiative, 2023; GCF, 2024).

Support Ecosystem Development

The development of support ecosystems is crucial for climate entrepreneurship success in Africa. FAO & UNFCCC (2024) highlight the importance of Farmer Field Schools (FFS) as an effective platform for empowering smallholder farmers in responding to climate change. Over the past three decades, the FFS approach has focused on people-centered learning, with the goal of creating a risk-free environment for knowledge exchange among small-scale producers, including farmers, foresters, pastoralists, Indigenous Peoples, and local communities.

For example, in Malawi, the FFS program works with local communities to develop climate-sensitive, catchment-specific adaptation and mitigation interventions for hotspots. The community adaptation plans generated through this process allow each FFS group to select strategies suitable for their location and design site-specific interventions (FAO & UNFCCC, 2024).

Ghana's climate entrepreneurship benefits from strong policies aimed at reducing emissions and promoting sustainability. The Nationally Determined Contributions (NDCs) prioritize climate-resilient agriculture, renewable energy, and green transport—creating clear focus areas for ventures.

Key policies include the Renewable Energy Act (2011), which enables independent power producers and supports off-grid solar solutions, and the Electric Mobility Framework, designed to accelerate electric vehicle adoption in logistics and public transport. On the partnership front, ventures like ShaQ Express are leveraging MOUs with government agencies such as the Ghana Health Service and Ministry of Food and Agriculture to build green logistics collaborations, unlocking new growth and impact opportunities.

Case Studies of Climate Tech in Agrifood Entrepreneurship in Africa

The intersection of climate technology and agrifood systems in Africa represents one of the most promising frontiers for entrepreneurial innovation across the continent. These case studies highlight how entrepreneurs are developing and deploying climate technologies to transform agricultural practices while building resilience to climate change.

1. Tolbi: Data-Driven Climate-Smart Agriculture

Tolbi exemplifies the growing trend of integrating satellite imagery and artificial intelligence to revolutionize farming practices across Africa. As a pan-African climate-agtech startup, Tolbi provides farmers with critical insights derived from remote sensing technology, enabling them to implement climate-smart agricultural practices tailored to their specific contexts.

The company's technology addresses a fundamental challenge highlighted by FAO & UNFCCC (2024): the need for context-specific climate solutions in agriculture. By providing localized climate and soil data, Tolbi helps farmers make informed decisions about planting times, crop selection, and resource management. This approach is particularly valuable in regions experiencing shifting rainfall patterns and temperature changes due to climate change.

Tolbi received investment from Catalyst Fund as part of its climate-focused fund, which recognized the startup's potential to significantly improve agricultural productivity while promoting adaptation to climate challenges (Catalyst Fund, 2023).

2. Zebra CropBank: Integrated Solutions for Smallholder Resilience

Nigerian startup Zebra CropBank takes a holistic approach to agricultural resilience by providing climate-smart solutions designed specifically for smallholder farmers. The company addresses the interlinked challenges that typically hold smallholders back, including limited access to quality inputs, technical knowledge, financing, and markets.

Zebra CropBank's model aligns with FAO & UNFCCC's (2024) emphasis on the importance of capacity building alongside technology deployment. Their platform integrates climate-smart farming practices with access to appropriate inputs and market connections, recognizing that technology alone is insufficient without supporting knowledge and resources.

By receiving investment from Catalyst Fund in January 2024, Zebra CropBank is positioned to scale its impact across Nigeria's agricultural sector, potentially reaching thousands of smallholder farmers with tools to build climate resilience.

3. NoorNation: Decentralized Energy for Agricultural Transformation

Egyptian startup NoorNation tackles one of the most critical constraints in African agriculture: energy access. The company provides decentralized solar energy and water solutions specifically tailored for farming businesses and underserved communities, addressing the water-energy-food nexus that is central to climate resilience.

NoorNation's approach directly addresses key challenges identified by FAO & UNFCCC (2024), who note that "energy is a needed input along all steps of the value chains; access to sustainable energy will be required to support the transformation of agrifood systems." By providing reliable, renewable energy for irrigation and other agricultural processes, NoorNation enables farmers to maintain productivity even in water-scarce conditions.

The startup's solutions are particularly valuable in Egypt's arid environment, where water management is a critical concern for agricultural sustainability. Catalyst Fund's investment in NoorNation recognizes the essential role of energy innovations in building climate-resilient food systems.

Conclusion

Climate technologies offer transformative potential for Africa's agrifood systems, enabling the continent to not only adapt to climate challenges but also to drive long-term economic growth and sustainability. However, the widespread adoption of these technologies hinges on overcoming persistent barriers related to financing, capacity building, and policy support.

As emphasized by the FAO & UNFCCC (2024), "greater attention should be given to undertaking context-specific assessments of local agrifood systems that account for natural resource use, consider socioeconomic inclusion, and are gender-responsive." This insight highlights the need for tailored solutions that reflect Africa's diverse agrifood landscapes, ensuring that interventions are both inclusive and impactful. By targeting high-impact sectors such as water management, agroforestry, and climate-smart agriculture, and developing innovative financing mechanisms, Africa can bridge its current investment gap and unlock the full potential of climate technologies.

Moreover, the role of financial institutions and policymakers cannot be overstated. As noted by the African Development Bank (2023), financing must be scaled up to meet the needs of smallholder farmers, particularly in areas of adaptation and resilience. Institutional support for entrepreneurship and local innovation will be key to driving sustainable change.

With the right investments and policies, Africa has the opportunity to lead the way in climate-resilient agriculture. By empowering local entrepreneurs, ensuring equitable access to finance, and prioritizing sustainable practices, Africa can transform its agrifood systems into models of resilience and prosperity, ultimately contributing to global climate goals and securing a sustainable future for generations to come.

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