



CHAPTER 10

# Innovative Financing Mechanisms for Climate Adaptation in African Agrifood Systems

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## Introduction

**A**grifood systems are a leading cause of climate change globally, as they are responsible for a third of anthropogenic greenhouse gas (GHG) emissions, the majority of which are tied to agricultural production (39 percent), followed by land use (32 percent) and supply chain activities (29 percent). Moreover, unsustainable agricultural practices continue to drive 80 percent of the loss of terrestrial biodiversity, soil degradation, and deforestation and are responsible for 70 percent of global freshwater withdrawals. GHG emissions are projected to increase by 60 to 90 percent through 2050 unless corrective action is taken (Apampa et al. 2021). Africa's share of global GHG emissions is small (2 to 3 percent) but rising, with agriculture and land use change as major contributors (Adolph, Griffiths, and Hou-Jones 2023; FAO 2022).

At the same time, climate change poses unprecedented challenges to agrifood systems worldwide. Despite Africa's marginal contribution to GHG emissions, the continent is highly vulnerable and disproportionately affected by climate change impacts because of its low adaptive capacities and strong dependence on climate-sensitive sectors. Moreover, the continent is warming faster than the world average on land and sea, with temperatures rising across all regions. Erratic rainfall patterns and extreme weather events also increasingly threaten African agrifood systems, resulting in crop failures, increased food prices, reduced job opportunities, and heightened food and nutrition insecurity (IPCC 2022). Small-scale farmers, operating predominantly on land plots ranging from 0.3 to 3 hectares, face heightened vulnerability to seasonal climate fluctuations, including droughts and floods. Rural women and girls, in particular, rely heavily on food systems for their livelihoods and often possess limited resources to prepare for and adapt to climate change (Adeniyi 2023a).

Adaptation measures in agriculture and food systems are therefore urgently needed to mitigate the adverse effects of climate change, reduce the continent's vulnerability to climate hazards, and foster the development of sustainable, resilient, and inclusive agrifood systems. Acting promptly is crucial, as postponing action will incur greater costs for the continent in the future (Meattle et al. 2022). Box 10.1 provides some examples of existing adaptation options in African agrifood systems.

### BOX 10.1—ADAPTATION OPTIONS IN AFRICAN AGRIFOOD SYSTEMS

A wide variety of adaptive solutions can help reduce African agrifood systems' vulnerability to climate change risks. They include on-farm practices such as crop diversification (for example, switching to less water-intensive crop varieties and species or integrating legumes as nitrogen-fixing crops that can improve soil fertility); regenerative agricultural practices, conservation agriculture, and agroecological approaches; land restoration and agroforestry; altered timing of key farm activities such as planting and harvesting; and integrated pest management. Another key adaptive measure is investment in research and innovation and extension services (for example, for the development and uptake of climate-resilient seed varieties). In addition, the use of digital tools for climate information services, such as early-warning systems and seasonal weather forecasts, can support farmers' adaptation efforts. Other examples of adaptive actions are disaster and emergency planning, social safety net interventions related to agricultural livelihoods, and the use of insurance products that help farmers manage weather risks (FAO 2023; GCA 2023; Knaepen 2022).

Developing innovative, sustainable bioeconomy\* solutions can also contribute to climate change adaptation, while often offering mitigation and carbon sequestration co-benefits. Examples include the promotion of ecosystem restoration and the sustainable management of forests and fisheries; the improvement of soil health and water retention capacity; the development of new value-added products from agricultural waste; investments in the production of modern bioenergy; and the support of indigenous livelihoods based on biological products and services (Gomez San Juan, Harnett, and Albinelli 2022; Malabo Montpellier Panel 2022b).

Identifying and assessing adaptation options is highly context specific, with the most effective adaptation options varying by specific locality, farming system, and farmer socioeconomic situation. Co-benefits and trade-offs also vary depending on the socioecological context (IPCC 2022).

\*Bioeconomy is defined as an economy based on the sustainable and circular use of biological resources and processes to produce food, feed, and bio-based products and services for all economic sectors (Malabo Montpellier Panel 2022b).

However, current global financial flows for adaptation are insufficient to meet the escalating needs of vulnerable communities. Developed countries are still falling short of their pledge to channel US\$100 billion<sup>1</sup> of climate finance per year to developing nations by 2025 under the United Nations Framework Convention on Climate Change (UNFCCC), including doubling adaptation flows to \$40 billion per year (as promised at the 26th United Nations Climate Change Conference [COP26] in Glasgow), and increasing the share of adaptation finance as part of the New Collective Quantified Goal on Climate Finance (Knaepen and Dekeyser 2022). Overall, Africa has access to a relatively small share of international climate finance, estimated at only 5 percent of the global finance available (Malabo Montpellier Panel 2022a).

Moreover, while agriculture and food systems have gained greater prominence in UNFCCC processes in recent years—with the agreement on the Sharm el-Sheikh joint work on climate action in agriculture and food security at the 27th United Nations Climate Change Conference (COP27) and the COP28 Leaders Declaration on Sustainable Agriculture, Resilient Food Systems, and Climate Action at the 28th United Nations Climate Change Conference marking significant milestones—sustainable food systems transformation remains chronically underfunded, making up only about 4 percent of climate finance between 2019 and 2020 (Chiriak, Vishnumolakala, and Rosane 2023a). Only 1.7 percent of global climate finance targets smallholder farmers, reflecting low levels of inclusivity of climate finance mechanisms (Chiriak and Naran 2020).

While the need to unlock additional climate adaptation financing and fulfill global commitments remains pressing, many African governments have started earmarking domestic public funds for adaptation activities to support their agrifood systems and are devising national frameworks to mobilize and deploy funding through various policy and institutional innovations (Malabo Montpellier Panel 2022a). Several nations, including several in Africa, formulated their nationally determined contributions (NDCs), national adaptation plans (NAPs), and national food systems pathways in the run-up to the 2021 United Nations Food Systems Summit; however, implementation efforts remain

fragmented and inadequate, with limited coordination among countries' food system pathways, climate policies, and investment strategies.

Unlocking climate finance for food systems adaptation faces several challenges. Some are typical of climate finance, while others are inherent to the nature of the agrifood sector—such as significant perceived risks, small ticket sizes, and high transaction costs. To overcome these hurdles, strengthening capacities at all levels is essential. Moreover, traditional funding sources, such as grants and loans, will be insufficient to mobilize the required funds for food systems adaptation. This necessitates exploring alternatives, including attracting private sector investment. Blended finance mechanisms, which combine public and private funds, and the design of scalable projects attractive to investors—including sustainable bioeconomy projects—may be promising avenues (Adeniyi 2023a).

Recognizing the critical role of finance and investments in building adaptation and resilience and promoting the transformation to sustainable food systems, this chapter explores innovative financing mechanisms that can fill the funding gap for climate action in African agrifood systems, with a focus on adaptation.

The chapter is structured as follows. First, we present an overview of the current state of climate finance flows to food systems in Africa. Second, we analyze the prevailing barriers that hinder the effective mobilization and use of climate finance for food systems adaptation in Africa. Third, we highlight the opportunities arising from a wide range of innovative financing tools and mechanisms to mobilize additional finance from both the public and the private sectors, with a focus on blended finance. Fourth, we describe the key building blocks to a conducive enabling environment for climate-related investments in agrifood systems. Last, we provide concluding remarks.

## *Overview of Current Financing Trends*

This section provides a brief overview of the current state of climate finance<sup>2</sup> flows to food systems in Africa, with a focus on adaptation finance. It evaluates various sources of finance to assess their adequacy in fulfilling Africa's food systems adaptation objectives. Our analysis shows that current climate finance

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1 All references to dollars are to US dollars.

2 There is no agreed-upon definition of climate finance. However, the UNFCCC provides an operational definition: "Climate finance refers to local, national or transnational financing—drawn from public, private and alternative sources of financing—that seeks to support mitigation and adaptation actions to address climate change" (Galbiati et al. 2023).

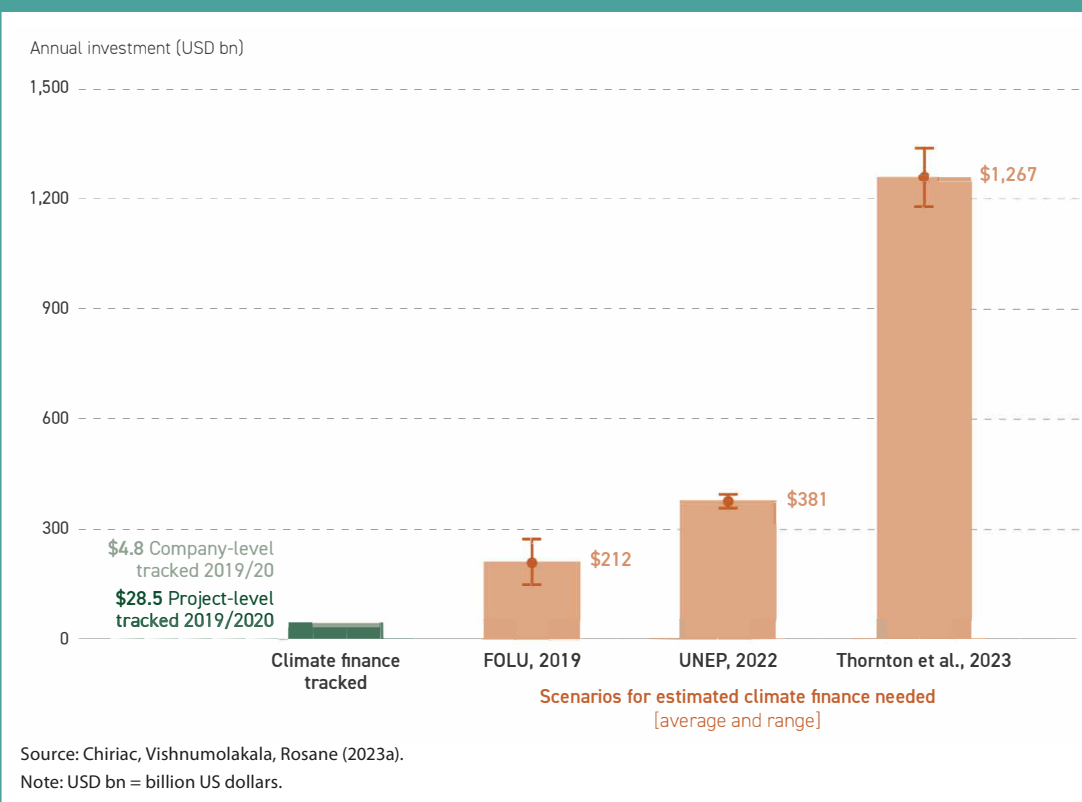
flows to agrifood systems fall significantly short of meeting Africa’s requirements. As such, both public and private actors need to significantly step up funding to address Africa’s climate finance needs in agrifood systems.

## Methodological Note

The assessment of climate finance flows for adaptation in agrifood systems, particularly in developing countries, is challenging because of insufficient transparency and reporting (Chiriac, Vishnumolakala, and Rosane 2023a). Inconsistencies in the official reporting of climate finance within the UNFCCC and difficulties distinguishing funds allocated for dual-purpose activities (both mitigation and adaptation) complicate the accurate assessment of progress in the goal of doubling adaptation finance (Knaepen and Dekeyser 2022).

In addition, there is still a paucity of information on the adaptation finance gap. Accurately assessing the financial requirements for adaptation requires reliable data, proficient modeling, and sufficient technical expertise. Without those components, assessments of needs tend to significantly underestimate the actual cost of adaptation efforts. Key challenges to determining adaptation needs include uncertainties about future risks, discrepancies in objectives, and differences in the geographic and sectoral scope of analysis. For example, recent analyses suggest that African countries’ predicted adaptation finance needs, based on NDC submissions, are likely less than half of those actually required. Notably, only 28 African countries provided cost estimates for adaptation in their NDCs (GCA and CPI 2023). A lack of rigor in the identification of vulnerabilities, priority sectors and actions, and costs contributes to such underestimation—with most NDCs lacking a quantitative assessment of adaptation goals and concrete figures in terms of financial needs (AfDB 2019).

**FIGURE 10.1—TRACKED CLIMATE FINANCE FLOWS TO AGRIFOOD SYSTEMS COMPARED WITH NEEDS**



In this section, we rely on recent estimates of climate finance flows provided by the Climate Policy Initiative (CPI), as well as data collected by the Organisation for Economic Co-operation and Development (OECD) Development Assistance Committee (DAC) as compiled in a report by Galbiati and colleagues (2023).<sup>3</sup> As for estimates of adaptation finance needs, we rely on recent reports from the Global Center on Adaptation, CPI, and the Malabo Montpellier Panel (Malabo Montpellier Panel 2022a), as well as scenarios developed by the Food and Land Use Coalition (FOLU 2019), the United Nations Environment Programme (UNEP 2022), and Thornton and colleagues (2023).

<sup>3</sup> The OECD DAC data are a comprehensive and accurate source of information about climate-related developmental flows from both bilateral and multilateral providers. This source includes official development assistance, other official flows, private grants, and private amounts mobilized and reported by DAC and non-DAC members, including multilateral institutions and private philanthropy. CPI, on the other hand, considers the entire architecture of climate finance and a broader range of financial aspects related to climate change, including public and private sector investments and domestic and nondevelopmental private climate finance.

## Recent Trends in Climate Finance Flows

According to CPI’s 2023 Global Landscape of Climate Finance, the amount of climate finance flowing to agrifood systems globally is extremely low. Agrifood systems received only 4.3 percent of total climate finance tracked at the project level in 2019–2020, with an annual average of \$28.5 billion. Of that tracked amount, 26 percent went to adaptation (\$7.3 billion), 51 percent (\$14.4 billion) targeted mitigation objectives, and 23 percent (\$6.7 billion) was dual-objective. In terms of sectoral allocation, two-thirds of adaptation finance targeted agriculture, while only 2 percent and 1 percent, respectively, targeted forestry and fisheries projects. Food loss and waste and low-carbon diets saw negligible investments, representing a missed opportunity in terms of adaptation for agrifood systems.

Comparing these numbers with the estimated climate-related investment needs for agrifood systems globally reveals that investments in agrifood systems need to increase, at a minimum, seven times from 2019–2020 levels to meet climate adaptation and mitigation objectives by 2030 (Figure 10.1) (Chiriatic, Vishnumolakala, and Rosane 2023a).

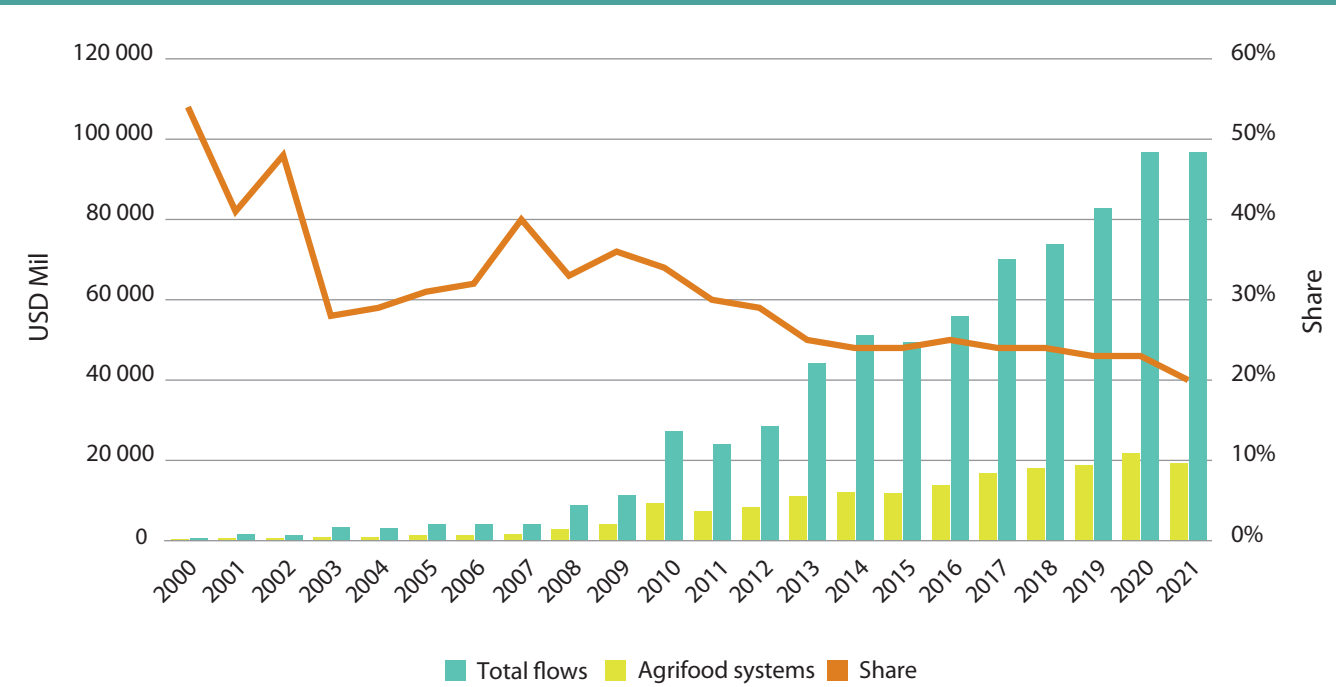
Moreover, a recent report from the Food and Agriculture Organization of the United Nations (FAO) highlights that the share of climate-related development finance flowing to agrifood systems globally is trending downward. After a peak year in 2020 (with an allocation of \$21.8 billion), climate finance for agrifood systems dropped by 19 percent in 2021—possibly also as a result of a shift in priorities due to the COVID-19 pandemic (Figure 10.2) (Galbiati et al. 2023).

Africa south of the Sahara received 16 percent of the agrifood climate finance flows tracked by CPI in 2019–2020, a total of \$4.4 billion. It is the second-largest

destination after East Asia. Nonetheless, considering how vulnerable food and agricultural production is in Africa, the financial gap to meet adaptation needs is staggering. The adaptation financing needs for Africa’s agriculture, forestry, and land use sector and its water sector will amount to approximately \$78 billion per year until 2030 (Malabo Montpellier Panel 2022a). Box 10.2 discusses the economic benefits of investing in adapting Africans agrifood systems versus the crippling costs of inaction.

Most of the tracked flows went to adaptation projects in agriculture, including, among others, the promotion of drought-tolerant crops, the provision of extension services for climate-smart agriculture and water management, and the establishment of early-warning systems providing climate and weather information (Chiriatic, Vishnumolakala, and Rosane 2023a). Several projects aimed to

**FIGURE 10.2—SHARE OF CLIMATE-RELATED DEVELOPMENT FINANCE TO AGRIFOOD SYSTEMS AGAINST GLOBAL FLOWS**



Source: Galbiati and colleagues (2023).  
 Note: USD mil = million US dollars.

### BOX 10.2—THE ECONOMIC BENEFITS OF ADAPTATION ACTION

Investing in adaptation action in African agrifood systems makes economic sense. According to the Global Center on Adaptation, the annual cost of inaction, including repeated disaster relief and recovery from floods and droughts, could reach as high as \$210 billion, equivalent to approximately 12 percent of the continent's gross domestic product (GDP). Regional impacts may exacerbate this, with Southern Africa potentially losing 10 percent of its GDP by 2050, and West and East Africa up to 15 percent by the same year. Investing in research, water management, infrastructure, land restoration, and climate information services could cost \$15 billion per year, representing just 0.93 percent of GDP. This indicates that the cost of taking action on climate adaptation and food systems is significantly less than the cost of inaction. Moreover, well-designed adaptation investments can alleviate the burden of climate impacts and yield economic, social, and environmental benefits. Adaptation not only reduces losses but also generates positive economic returns and fosters sustainable development outcomes. For example, tailored adaptation programs in agriculture can produce co-benefits across various sectors, contributing to mitigation efforts and sustainable development objectives (Malabo Montpellier Panel 2022a).

secure land tenure rights for farmers—an important enabler of investments in long-term, sustainable land management practices, as well as a key form of collateral that can improve farmers' ability to access financing (Chiriac and Naran 2020). Africa south of the Sahara was the largest recipient of forestry adaptation finance (40 percent). Nonetheless, given the acute vulnerability in the region—where less than a quarter of forests are under forest management plans—the scale of these financial flows is far below the region's needs (FAO 2020 cited in Chiriac, Vishnumolakala, and Rosane 2023a).

The adaptation finance gap in African agrifood systems is particularly large when looking specifically at small-scale agrifood systems. Globally, less than 1 percent of climate finance targets this sector, amounting to just \$5.5 billion, which falls far short of the needs of farmers and other value chain actors (Chiriac, Vishnumolakala, and Rosane 2023b).<sup>4</sup> Of this amount, \$1.86 billion (that is,

34 percent, the largest share) targeted Africa south of the Sahara, reflecting the predominance of small-scale farms in the region. However, considering that Africa's agriculture and food systems face the most significant climate vulnerability on a global scale, the need for further funding is urgent.

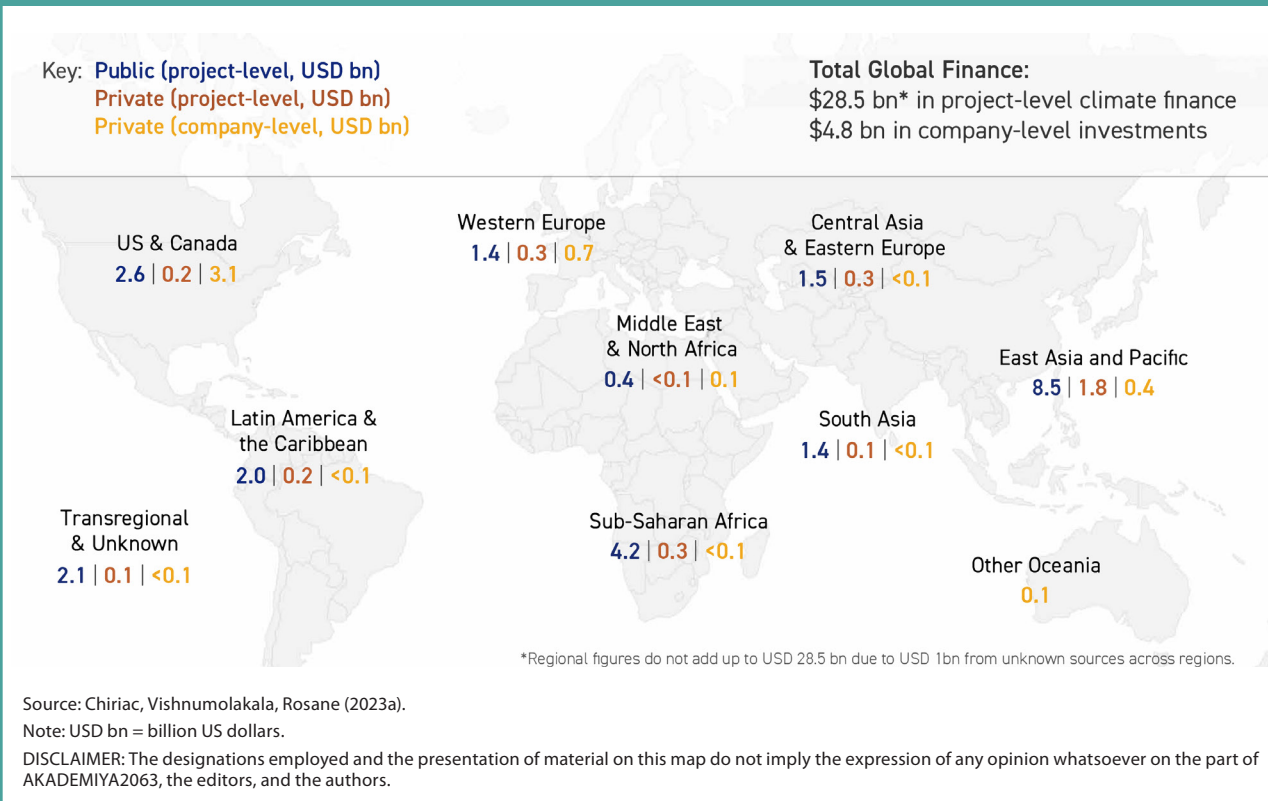
Moreover, current climate finance flows inadequately address gender inequality and social exclusion. The impacts of climate change are likely to aggravate existing gender inequalities and marginalization patterns as a result of distinct gendered vulnerabilities and capacities to face and recover from climate impacts, as the Intergovernmental Panel on Climate Change's *Fifth Assessment Report* underscores (Schalatek 2022). Rural women, in particular, rely heavily on agrifood systems for their livelihoods, but financial institutions see them as riskier borrowers given their limited land ownership, lack of collateral, and weaker credit history. This limits their ability to access financial support and adapt to the changing climate, making them even more vulnerable to its impacts (FAO 2024). Policies and programs that consider the specific needs and contributions of both women and men have been associated with increased effectiveness in achieving their adaptation objectives (UNEP 2023). Nonetheless, gender-specific considerations are still largely overlooked in global climate finance flows, including those targeting agrifood systems. A lack of awareness and understanding among climate finance resource partners, as well as inadequate data and research on the gender dimensions of climate change and climate finance, are among the main reasons for this oversight (Galbiati et al. 2023; Meattle et al. 2022; Pettinotti, Cao, and Kamninga 2023).

Concerning the finance sources, nearly all financial flows tracked by CPI in 2019–2020 were international, coming from Western Europe (47 percent) and North America (18 percent).<sup>5</sup> African agrifood systems rely primarily on public climate finance, mostly from multilateral development finance institutions (DFIs) through concessional debt and grants, while private funding is negligible (Figure 10.3). Also, Africa south of the Sahara receives more than half of all philanthropic funding serving agrifood systems—much of which is disbursed in grants (targeting the promotion of agricultural adaptation options such as regenerative agricultural practices, integrated pest management, and climate-resilient crops). These trends reflect the existing barriers to financing

4 Although an estimate of the climate finance needs of small-scale agrifood system is not available, a general estimate of the unmet financing needs of smallholder farmers is \$170 billion annually and \$106 billion for agricultural small and medium enterprises (ISF Advisors 2022, cited in Chiriac, Vishnumolakala, and Rosane 2023b).

5 Most of the data underlying the analysis by Chiriac, Vishnumolakala, and Rosane (2023a) is reported by development finance institutions and bilateral donors—thus, these trends may reflect that bias in the data collection.

**FIGURE 10.3—SOURCES OF CLIMATE FINANCE BY GEOGRAPHIC DESTINATION, 2019–2020**



In sum, as our analysis underscores, existing finance flows for climate-related action in African agrifood systems fall significantly short, particularly in meeting adaptation requirements. Addressing that deficit demands concerted efforts from all stakeholders, encompassing both public and private sectors, to ramp up funding for the climate needs of African agrifood systems. In the next section, we delve into the obstacles hindering increased investment in climate-related action, with a particular focus on adaptation. In the section on “Opportunities for financing” below, we explore innovative financing mechanisms capable of augmenting both public and private funding for agrifood systems.

## *Barriers to Leveraging Climate Finance for Food Systems*

Scaling finance for food systems in Africa is hampered by a number of barriers. While some of these obstacles are typical of climate finance, others are inherent to the agrifood sector. Broadly,

agrifood systems (see section on “Barriers to leveraging climate finance for food systems” below), whereby public and philanthropic finance generally fills the gap left by commercial financial institutions that have little appetite for investments in agrifood systems due to high risks, low returns, and high transaction costs (Chiriac, Vishnumolakala, and Rosane 2023a).

One pathway to accelerate private investment in climate change adaptation is through developing the bioeconomy in African nations. Although we lack comprehensive data on how much finance and investment in African agrifood systems is directed toward the bioeconomy, Box 10.3 provides examples of untapped investment opportunities in this sector. By unlocking these investment opportunities, African countries can achieve a more sustainable and climate-resilient agrifood system.

we can categorize barriers to increasing public and private investment in food systems adaptation in Africa as 1) structural and financial, 2) institutional and governance, and 3) technical.

### **Structural and Financial Barriers**

Many African countries struggle to allocate adequate domestic funds for food systems adaptation. Their governments face significant challenges related to debt burdens, limited tax bases, borrowing capacity, and budget constraints while dealing with competing development priorities. These factors, combined with higher government borrowing costs amid rising global interest rates, create significant challenges in mobilizing public finance to address critical climate finance demands (Li, Natalucci, and Ananthakrishnan 2022). Furthermore, governments

### BOX 10.3—UNTAPPED INVESTMENT OPPORTUNITIES IN THE BIOECONOMY

A sustainable and circular bioeconomy offers promising avenues for climate change adaptation in the agrifood sector in Africa. The following are examples of untapped investment opportunities:

- Regenerative agricultural technologies that promote soil health and fertility and improve water retention capacity
- Development and distribution of climate-smart crop varieties
- Development and distribution of biofertilizers, biopesticides, and bioremediation technologies that help increase agricultural productivity and resilience while supporting ecosystem restoration and carbon sequestration
- Sustainable development of tree-based systems, including agroforestry, which increase forest health and prevent soil erosion
- Development and distribution of new food sources (such as seaweed, microalgae, edible insects, cell culture–based food products, plant-based protein alternatives, and 3-D printed food) that can support food security goals while reducing input, energy, and water intensity
- Development and distribution of bio-based technologies for improved waste management, such as conversion of organic waste into compost and renewable fuels (Gomez San Juan, Harnett, and Albinelli 2022; Malabo Montpellier Panel 2022b)

Despite the potential of bioeconomy and nature-based solutions to yield both economic and environmental benefits, private capital investment remains limited because of the perceived or real risks associated with such projects. However, the growing track record of success in private sector forestry investments offers a potential model to bridge this financing gap (Throp et al. 2023). Demonstrating market viability—for instance, by showcasing established products, producers, and buyers and addressing challenges faced by bioeconomy businesses, such as regulatory hurdles or lack of certification—can also help reduce perceived risks and build investor confidence in bioeconomy investments. In addition, the application of distributed ledger technologies (for example, blockchain) for enhancing supply chain traceability, certification, and risk mitigation can reduce administrative burdens and create a level playing field for small-scale producers. Last, implementing pilot programs and exploring blended finance solutions can further mitigate risks and attract the requisite volumes of private investment (Leoussis and Brzezicka 2017; van Pul, Valladares, and Wolfs 2023).

often require initial capital to secure cofinancing from other sources or to establish new financial instruments for adaptation purposes, but such funds are not always readily available (Malabo Montpellier Panel 2022a).

Smallholder farmers and agricultural small and medium enterprises (agri-SMEs), in particular, face significant investment constraints in adaptation efforts, partly due to their limited financial capabilities. These actors struggle to cover the initial investment costs and have limited access to financial services. The constraint to access is due to greater transaction costs for investors associated with geographically dispersed customers; small ticket sizes; loosely structured value chains; high perceived environmental, productivity, and market risks; and high interest rates. In Africa, less than 3 percent of all financial credit goes to agriculture, and interest rates can be as high as 47 percent (Malabo Montpellier Panel 2022a). Furthermore, the localized and often small-scale nature of adaptation projects and concerns about scalability further deter investors (Micale, Tonkonogy, and Mazza 2018).

A lack of collateral and limited land tenure rights limit farmers' ability to secure financing. The very small size of smallholdings also means that the value of the land may not provide sufficient collateral cover for commercial loans. Gender disparities in ownership and access to resources, including land titles and land rights and technology, coupled with sociocultural barriers are a challenge for female farmers, reducing their ability to access climate finance compared with male farmers and heightening their exposure to climate risks. In addition, gender inequality is evident in climate financing from development partners, with only 3 percent of climate-related official development assistance in 2021 having gender as a principal focus (Ibrahim et al. 2023).

Farmers often encounter discrepancies between their financial needs and the available market offerings. For instance, repayment schedules may not correspond to farmers' production cycles, the loan amounts offered are usually too low, and capital costs may be prohibitively high—especially when demanding long-term financing. The reliance on rainfed agriculture implies that, depending on the commodity, planting and harvesting seasons may occur only once a year, exposing farmers and investors to an elevated risk of loss as weather



patterns become more irregular due to climate change. Furthermore, inadequate contractual regulations and enforcement expose offtake arrangements to risks such as side-selling (Chiriatic and Naran 2020; Galbiati et al. 2023).<sup>6</sup> These factors, inherent to the agriculture sector, serve as significant impediments to financing food systems adaptation in Africa.

Uncertain risk–return profiles further complicate food systems adaptation investments in Africa. Such investments typically do not yield immediate financial returns and involve substantial upfront costs and uncertainties surrounding climate impacts (Adeniyi 2023b; Ahairwe et al. 2022; Micale et al. 2018). While adaptation projects offer long-term benefits, the longer horizons to generate revenues make them less attractive for market-rate investments. Moreover, the prolonged payback periods and heightened risks associated with investing in vulnerable communities are incongruent with the risk-averse nature of many private investors (Adeniyi 2023a). Seasonal variations in agricultural cash flows, compounded by climate variability, exacerbate challenges for both producers and finance providers, increasing the risk of default. These factors collectively make food systems adaptation projects often “unbankable,” prompting financial institutions to hesitate in funding such initiatives. This is in contrast to some mitigation initiatives, such as those related to forestry, which often provide more predictable revenue streams (for example, earnings from the sale of carbon credits or harvested biomass) and hence appeal to commercial investors. Such projects often have shorter payback times and clearer revenue pathways, which increase their attractiveness for finance (Chiriatic, Vishnumolakala, and Rosane 2023a). Thus, the potential exists to leverage investments in bioeconomy projects that offer both climate adaptation and mitigation benefits for agrifood systems, including investments in carbon sequestration, soil health improvements, and cultivation of climate-resilient crop varieties.

## Institutional and Governance Barriers

Investments in food systems adaptation in Africa are also constrained by governance and institutional bottlenecks. Many African countries lack the requisite legislation and regulations to accelerate finance for food systems adaptation, and where such policies exist, their effectiveness is limited by inadequate oversight and

institutional coordination. Policy constraints range from a lack of explicit policies encouraging intersectoral collaboration to a lack of an enabling environment supportive of private investment. The presence of regulatory risks, including the functioning of the regulatory environment and potential changes in response to climate change such as subsidy reform, carbon tax implementation, and permitting processes, can deter climate investment (Adhikari and Chalkasra 2023). Private investors require coordinated institutional arrangements and investment environments characterized by regulatory and political stability, enforceable laws, and the protection of property rights (Micale et al. 2018; Tall et al. 2021).

The absence of coherent adaptation regulations, policies, plans, budgets, and investment plans is a deterrent for potential private investors in food systems adaptation. A mere one-third of African countries have formally submitted their NAPs. Furthermore, only about half of African nations possess a favorable environment for adaptation investments, as evidenced by their good performance in governance and planning elements, including institutional arrangements, the development of sectoral plans, estimation of finance needs, integration of adaptation with disaster risk reduction initiatives, and monitoring and evaluation of adaptation objectives (Eichhorn et al. 2023). For instance, Angola has provided cost estimates for adaptation action by sector and type of commitment (conditional and unconditional) and has further outlined specific strategies for mobilizing the required resources, and Kenya has effectively developed an integrated measuring, reporting, and verification (MRV) system, as well as integrated MRV tools for adaptation action (Eichhorn et al. 2023).

Furthermore, challenges in multilevel coordination result in gaps and inefficiencies in agrifood systems adaptation finance for Africa. At the international level, coordination among donors, implementing agencies, and DFIs is difficult because they often “speak different languages” and have different processes and interests (Karaki and Bilal 2022). The different global climate funds have diverse eligibility criteria, methods, and modalities, which have proven difficult to navigate for institutions involved in supporting food systems adaptation (Le Houérou 2023). In addition, aligning international climate funds with national priorities and strategies is often problematic, manifesting as a mismatch between donor agendas and the climate finance needs of recipient nations (Iacobuta et al.

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<sup>6</sup> Offtake arrangements refer to contracts where a buyer agrees to purchase future production from a seller. Side-selling occurs when the seller breaches the contract by selling the goods to a different buyer, often for a higher price.

2022; Qi and Qian 2023). At the national level, there is inadequate coordination among sectoral ministries, departments, and agencies, as well as between national and subnational governments, to collectively respond to the need to harness resources for food systems adaptation (Bellali et al. 2018). In Kenya, for instance, budget codes for climate-related expenses are not synchronized between national and local levels, making it difficult to track climate expenditures (Adeniyi 2023a).

Public-private sector partnerships can stimulate private capital investment for food systems adaptation in Africa. Similarly, collaborations among donors, DFIs, public development banks (PDBs), civil society, and local actors are required to catalyze private sector investment in food systems adaptation. Such partnerships, however, are underused, creating a gap in the effort to finance food systems adaptation using private capital.

## Technical Barriers

The complexity of requirements to access many climate funds demands a level of capacity that is not always available at the national and subnational levels in Africa, limiting access to funding. Securing climate funding entails gathering technical information, conducting climate vulnerability and risk assessments, and preparing detailed analyses. However, national and local governments often face human resource and expertise constraints, which limits their ability to prepare such applications effectively (Adeniyi 2023a; Restle-Steinert et al. 2019; Rossi, Gancheva, and O'Brien 2017). Moreover, national strategies, such as NAPs, often lack adequate specificity and concrete project pipelines (OECD 2023).

In addition, meeting the stringent accreditation standards set by funds such as the Green Climate Fund (GCF) proves challenging, often requiring reliance on international entities (Soanes et al. 2017). The GCF, the world's largest fund dedicated to helping countries respond to climate change, created the Enhancing Direct Access program in 2015 to facilitate access for local organizations and to promote stakeholder-driven programmatic approaches to climate financing. However, because of the stringent criteria and perceived intensity and scope of the submissions and audits, few proposals are actually submitted (Tietjen, Rampa, and Knaepen 2019). Although the GCF is on schedule to allocate its adaptation-related funding following the priorities it has established in terms of country groups, disparities in access favor those with better institutional capacity—that is, middle-income countries (Garschagen and Doshi 2022).

The GCF's slow and cumbersome proposal processes prevent many countries, primarily least developed countries in Africa and nations with weak capacity and with the highest levels of climate vulnerability, from sufficiently accessing project funding. In addition, many countries are currently not able to independently access project funds through their national entities, thus inhibiting direct access and country ownership (Garschagen and Doshi 2022).

There is also a lack of understanding of the risks and opportunities associated with climate change in many African countries, which is often due to the complexity of making disaggregated, reliable, and comprehensive data and information on climate risks and vulnerability available (Clark, Reed, and Sunderland 2018; Chirian and Naran 2020; Micale et al. 2018; Prasad et al. 2022; Restle-Steinert et al. 2019; Tall et al. 2021). There are also significant uncertainties regarding the future implications of climate change, socioeconomic considerations, population and migration trends, and policy and behavioral shifts (OECD 2023; Restle-Steinert et al. 2019; Tall et al. 2021). This lack of granular data impedes investment decision-making, making it challenging to invest in climate actions in food systems (Adeniyi 2023b; Restle-Steinert et al. 2019).

At the local level, many actors, including small businesses, SMEs, and smallholders, often lack the technical capacity to analyze climate risks, conduct feasibility studies, and identify climate-resilient investment opportunities. Small-scale producers fail to engage with climate-smart practices due to a lack of knowledge and financial incentives. Moreover, there is often a shortage of local expertise available to assist these actors, further limiting their ability to attract climate finance. Even when expertise is accessible, it tends to be temporary, with insufficient mechanisms in place to integrate the knowledge and skills into permanent structures, systems, and processes at the local level (Adeniyi 2023a).

## *Opportunities for Financing: Improved Mechanisms for Public and Private Finance for Food Systems Adaptation*

In this section, we review the mechanisms and financial instruments that can be used to support sustainable and climate-resilient food systems. We discuss in particular the financial structuring process that leverages public and philanthropic

capital to attract private investment in food systems adaptation. Additionally, we highlight instructive case studies, explore the challenges experienced and limitations to scale, draw key lessons, and assess opportunities to enhance and scale financing, with an emphasis on de-risking strategies and improving risk-return profiles to align the incentives of diverse capital providers.

## Innovative Financing Mechanisms for Climate Action in Agrifood Systems

Transforming global food systems to become sustainable is essential to building climate resilience, protecting ecosystems and ensuring food security. The Food and Land Use Coalition estimates that the transition to sustainable food systems will require more than \$300 billion annually, including \$188 billion for small-holder farmers' inputs and mechanization (Apampa et al. 2021). However, IFPRI (2022) warns that “public financial resources, including multilateral development assistance, are not sufficient” to meet these needs. In addition, the bioeconomy offers significant potential to reduce GHG emissions along the agrifood system by replacing fossil-based resources and processes with biological ones, from microbiome innovations, biofertilizers, and biopesticides to new food sources, bio-based plastics and textiles, and biological waste management (Gomez San Juan, Harnett, and Albinelli 2022). This untapped potential can support both climate change mitigation and adaptation (see Boxes 10.1 and 10.3).

Historically, commercial banks and microfinance institutions have served as the primary sources of lending to the food and agriculture sector. A 2019 report by the United Nations Conference on Trade and Development (UNCTAD) notes that banks financed the sector to the tune of \$700 billion annually between 2015 and 2017, while foreign direct investment contributed \$36 billion, official development assistance provided \$11 billion, and public capital expenditures amounted to \$9 billion (UNCTAD 2019). While this picture represents global averages, the context in Africa south of the Sahara is different because commercial banks play a very limited role in lending to the food and agriculture sector (Prato, Clubb, and Rossman 2021). This trend has remained largely unchanged in the past decade; as Allen, Otchere, and Senbet (2011) point out, “a large number of banks shun private credit and instead invest in safer government securities, notably, treasury bills.” Given the numerous sectoral risk factors, overall financing

and funding flows have remained small relative to actual capital needs, leaving a considerable funding gap that is commercially unattractive for private investors. The major challenge, therefore, is to structure the food and agriculture sector so that it is both “bankable” and “investable” in order to attract larger volumes of financing and investments by catalyzing private investment (Apampa et al. 2021).

The global financial and capital markets comprise financial assets valued at \$400 trillion. A small percentage of that value could readily finance the transition to sustainable agrifood systems and at the same time create positive environmental and social externalities. However, given the risk aversion and varying levels of risk appetite of these private investors, as well as their regulatory constraints and fiduciary obligations, it is clear that unless the market structure, business models, and the ensuing transactions along food and agricultural value chains are appropriately commercialized, the potential to scale private financing and investment will remain latent (Apampa et al. 2021). The challenge of attracting private financing and investment at scale is underpinned by (1) the compelling information asymmetries between investors and local actors; (2) high transaction costs driven by small financing needs and the overall small size of operations; (3) the informality of operators in the sector; (4) low levels of mechanization and technology use; (5) high volatility of commodity prices; (6) adverse macroeconomic conditions; and (7) political risks.

In Africa, value chain financing (from agro-dealers, off-takers, agro-service providers, and fintech companies) has been prominent in the recent past (ISF Advisors, Mastercard Foundation, and Rural and Agricultural Finance Learning Lab 2019 cited in SAFIN and Convergence 2021). Mobile service providers and agricultural and financial technology (agtech and fintech) companies have become increasingly significant lenders to the sector, particularly in East Africa.

Wattel and colleagues (2024) describe financial instruments that specifically target low-emission food systems, and that therefore directly contribute to GHG mitigation. These consist of investments made by financial institutions, investors, and public entities. Traditional financial instruments include debt (commercial and concessional), equity (commercial and concessional), credit enhancement through guarantee and insurance products, and fixed-income assets such as bonds. Such instruments can be structured with a purely commercial mandate with its attendant expectation to deliver attractive risk-adjusted returns, or they may pursue an impact mandate, or a combination of both. They can also

be constructed as green finance<sup>7</sup> products that integrate environmental, social, and governance (ESG) considerations. For instance, sustainability-linked loans deliver both market-rate financial returns and economic returns for positive environmental and social outcomes. Demand for sustainability-linked loans is surging, especially in South Africa, which hosts the region's deepest capital markets (Fazel and Couzyn 2021). Notably, Rand Merchant Bank and Standard Bank have issued sustainability-linked loans valued at \$450 million and \$750 million, respectively (RMB 2024; Standard Bank Group 2023). These instruments and structured finance approaches are equally applicable to investments in the bioeconomy.

Wattel and colleagues (2024) further note how structured finance products can leverage the capital markets to “accelerate the low emission transition” in food systems. Institutional investors, made up of asset owners and asset managers, are increasingly cognizant of the importance of incorporating ESG guidelines in their investment portfolios, with many seeking to make responsible investments and signing up to various conventions. Accordingly, they are becoming more sophisticated in screening various asset classes through an ESG lens to ensure that their investment portfolios are green. This has resulted in the emergence of more green bonds and green investment funds that are mobilizing capital to support more resilient food systems while providing capital for smallholder farmers, processors, agribusinesses, and other value chain actors.

Carbon credits are also becoming more prominent at the production stage through the voluntary carbon market, where entities pay agricultural producers and supply chain companies for their activities and operations that help to eliminate or reduce carbon emissions. Consumers are also playing their part by accepting price premiums for sustainable and climate-friendly products, as well as interest discounts on climate investments (World Bank 2021).

Green finance practitioners could be local, regional, or national producers or producer communities investing in projects that have a positive impact on the environment. Green loans and bonds are useful throughout the supply chain, such as in primary production (comprising inputs, equipment, and service providers) as well as in postproduction (comprising trading, stocking, and processing). Such investments are targeted to generate environmental benefits.

Green loans for climate-smart agriculture, sustainable agriculture, sustainable supply chain solutions, and waste management, in particular, are gaining prominence. However, for smallholder farmers and small agri-SMEs, green finance remains an elusive financing option, given their difficulties accessing credit from financial institutions. Their recourse is that they are invariably indirect beneficiaries, where large companies who leverage the green finance market create inclusive, green supply chains that benefit from the green conditionality.

Grants and public sector debt remain the primary instruments used to finance agriculture, forestry, and land use given the high perceived (and real) risks associated with the sector, as previously highlighted. Blended finance, a financial structuring approach that leverages concessional capital from public and philanthropic sources to de-risk transactions and improve their risk–return profiles to attract private investment, is becoming mainstream as a lever to crowd in private capital. According to Convergence (2021), blended finance has become an important instrument to support the 2030 Agenda for Sustainable Development and agriculture-focused transactions accounted for 28 percent of the total blended finance market in 2020, a marked increase from only 16 percent in 2015–2017.

Food supply chains are global and are vulnerable not only to climate change but also to macroeconomic shocks, as seen in recent years with the global COVID-19 pandemic and Russia's invasion of Ukraine and the subsequent rise in food and fertilizer prices, which had knock-on destabilization effects. Minimizing vulnerability to these shocks requires innovative approaches, such as diversity in supply nodes, incorporating redundancy, “just-in-time” inventory, and alternate sources of financing. To build climate resilience, supply chain partners can offer favorable financing terms to suppliers who are aligned with agreed-upon sustainability targets, while helping food value chain companies incorporate ESG into their operations.

Insurance reassures investors that they can recoup their investment if unforeseen events occur, such as the adverse impacts of climate change. It therefore minimizes the risks associated with investing in sustainable food systems and further provides downside protection to investors. Insurance, as a tool, can thereby facilitate the transition to sustainable food and agriculture and land use

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7 *Green finance* is a subset of sustainable finance and involves debt and equity instruments that seek to create positive environmental externalities.

practices, while managing price volatilities and yield risks related to climate change. Responsive insurance products are therefore an important instrument in building resilient food systems. Rectifying the low penetration of agricultural insurance in Africa is a compelling opportunity to achieve food security. Many African smallholder farmers remain vulnerable due to the wide variance in coverage, although their greatest risks are weather variability and the adverse impacts of climate change (Africa Insurance Organisation 2023, cited in Jimenez-Sanchez 2023).

### Blended Finance for Agrifood Systems: Lessons Learned and Best Practices

Despite a staggering \$379 trillion in global financial assets, only 4 percent are invested in developing countries, primarily due to the speculative sovereign risk ratings of their economies. Notably, a scant 11 percent of these countries are classified as investment grade (S&P equivalent of BBB or better), and of those, only two are in Africa— Botswana and Mauritius. Because no corporate entity or transaction can be rated higher than the sovereign due to political risk, innovative approaches, such as those deployed through blended finance, are useful in improving the “investability” of developing countries in general and of “risky” sectors such as those that underpin food systems and the bioeconomy. Blended finance is a useful approach that also helps address the constraints faced by regulated financial institutions, such as banks and insurance companies, which are restricted from lending to risky market segments where the high expected losses far exceed their investment mandates and criteria (Apampa et al. 2021).

The application of blended finance in the food and agriculture sector in particular seeks to de-risk transactions, but it also focuses on reducing the overall transaction costs to create more headroom for acceptable risk-adjusted returns (Prato, Clubb, and Rossman 2021). Apampa et al. (2021) identified four factors that contribute to the current sustainable food systems funding gap: “(1) high country and sector specific risks, (2) poor primary data and information

**TABLE 10.1—TYPES OF RISK HINDERING PRIVATE INVESTMENT IN AGRIFOOD SYSTEMS**

Project/firm level risks	Constraints in financial absorption capacity	Country risks
<b>Business risks:</b> New untested business models or transition risks related to sustainability	<b>Informal sector:</b> New untested business models or transition risks related to sustainability	<b>Macroeconomic risks:</b> Global emerging markets risk, geopolitical risks, supply chain vulnerability, fiscal constraints, inflation, etc.
<b>Agronomical risks:</b> Unpredictable farm output and revenue due to unsustainable agro-economic practices that affect product quality/quantity	<b>Lack of conventional security for lenders:</b> Limited or lack of collateral available to lenders, especially in jurisdictions where land rights are not well established	<b>Policy risks:</b> Limited domestic policy capacity in relation to food systems (domestic support, trade policies, infrastructure policy, etc.)
<b>Natural hazards:</b> High exposure to increased frequency and intensity of extreme climate events in the form of droughts, wildfires, hurricanes, and floods, etc.	<b>Small ticket size:</b> The average ticket size for agribusiness loans is small (compared to other industries)	<b>Political risks:</b> Domestic instability, political violence, lack of clear political leadership on sustainable development
<b>Commodity market risks:</b> Increased volatility of commodity prices, which affect costs, revenues and profitability	<b>Shallow domestic financial markets:</b> Local financial resources are undersupplied, and then only small amounts are available to food systems	<b>Inadequate enabling environment and regulatory capacity:</b> Insufficient capacity to institute and enforce regulations to enable sustainable finance
Source: Apampa et al. (2021).		

asymmetries between financial institutions and potential borrowers in rural financial markets, (3) the mismatch between investment needs of farmers and producing companies and different pools of capital, e.g. development finance institutions, banks, pension funds, insurance capital, and (4) high transaction costs and small ticket sizes.” These constraints result in an insufficient pipeline of bankable projects to attract financial institutions. Despite the vast environmental and social benefits that could be unlocked by transitioning the food system to more sustainable practices, the transition could lead to unacceptable financial losses for institutions.

Table 10.1 summarizes the diverse risk sources that discourage private investment, which are instructive for structuring commercially viable food system transactions that can deliver environmental benefits, promote food security, and provide attractive risk-adjusted returns.

#### BOX 10.4—THE CASE OF AGR13 FUND

AGR13 Fund is a blended finance fund that seeks to mobilize \$1 billion in financing by providing credit enhancement and technical assistance investment projects and businesses to facilitate the transition to sustainable agricultural value chains, while minimizing deforestation. It serves to de-risk loans made by commercial banks and other financial institutions to agri-SMEs and projects that improve agricultural productivity, reforestation, and rural livelihoods. The fund extends guarantees to achieve this purpose.

As a financial structuring approach, blended finance can structure investments in resilient food systems transition through risk mitigation. The waterfall structure,<sup>8</sup> first-loss provisions, overcollateralization, and excess spread could create a risk buffer that provides protection (and comfort) to investors and financiers in the event of defaults leading to losses. Other risk mitigation measures could include letters of credit, cash collateral accounts, security bonds, guarantees, insurance, and credit derivatives, which serve as credit enhancement to also provide downside protection to lenders. Such instruments can all leverage concessional funding from public and philanthropic sources to crowd private commercial lenders into an otherwise risky sector. Box 10.4 provides a prime example of how blended finance can catalyze private investment in sustainable agriculture by providing credit enhancements and technical assistance to de-risk high-impact projects.

We emphasize that the ultimate objective of blended finance is to catalyze private investment at scale to close the Sustainable Development Goal (SDG) funding gap. Therefore, when considering what specific structuring approach to deploy to finance resilient food systems, it is critical to ascertain the commercial mandates, risk appetite, and financial return requirements of private investors to

#### BOX 10.5—THE CASE OF BUILD FUND MALAWI

BUILD Fund Malawi aims to end poverty and hunger by increasing investment in agriculture and other manufacturing and service supply chains, as well as increasing productivity within those supply chains through technology and innovation. It further seeks to achieve gender equality by supporting businesses where women are significantly represented in boards, management, staff, suppliers, or buyers. It aims to create 3,000 jobs (30 percent minimum for women and youth), integrate 75,000 small-scale producers into investees' supply chains, increase participating small-scale producers' income by 30 percent, expand fiscal space with aggregated income taxes of \$19.3 million, and strengthen 15 supply chains.

BUILD Fund Malawi and the accompanying BUILDER Technical Assistance facility will support businesses with a combination of loans, equity, and technical assistance. BUILD Fund Malawi is a structured blended finance window of the BUILD Fund, managed by Bamboo Capital, with a target capitalization of \$35 million. Through the BUILDER facility, technical assistance will be provided to businesses both before and after investment to improve the quality of their growth and SDG impact as well as reduce associated risks and costs.

The \$35 million impact fund has a \$15 million first-loss layer and a \$20 million mezzanine tranche. It will employ senior loans, subordinated loans, and mezzanine equity ranging from \$250,000 to \$2.5 million to support projects in the target sectors. The average time frame for an investment is three years, but it can last up to eight. The fund has an estimated internal rate of return of 5 percent, and 21 projects have been preliminarily identified for due diligence and potential investment.

<sup>8</sup> *Waterfall* describes how investment returns are distributed among investors. In simple terms, it determines and lays out the order in which profits are shared. *First loss* provides a risk buffer or layer of protection for investors in senior tranches, meaning that the first-loss capital absorbs the initial losses, and investors in the senior tranches are protected. *Overcollateralization* simply means that the value of collateral provided for a loan exceeds the value of the loan and reassures lenders that they will be able to recoup their principal in the event of a default.

### BOX 10.6—THE CASE OF PASS TRUST

PASS (Private Agricultural Sector Support) Trust provides credit guarantee cover to local financial institutions to top up clients' collateral to help them become eligible for loans. Although other credit guarantee schemes exist in Tanzania, PASS Trust is the only one offering banks a guaranteed coverage ratio of 50 to 75 percent, with up to 80 percent for projects owned by women or youth. While other guarantee schemes offer better rates, PASS Trust remains competitive through its unique combination of business development and financial services, deposit of cash in partner banks, and swift response to claims. PASS Trust works with more than 15 commercial banks in the country. With its guarantee funds, it can attract other private sector funds for development objectives.

It provides credit guarantees across the agricultural value chain and offers different products, such as traditional guarantees, portfolio guarantees, and institutional guarantees. PASS Trust has forged close relationships with a range of stakeholders to establish blended donor funds (guarantees); sovereign guarantees (unfunded in the case of Sweden); commercial senior debt guarantees; portfolio guarantees and guarantees; commercial senior debt or private equity investments; and weather index insurance. At the beginning, the leverage with financial institutions was 1:1; in other words, for every loan it guaranteed, PASS Trust had to commit the full amount for which it had assumed risk. However, with increased financing from DANIDA and other donors, as well as a track record of paying claimed guarantees on time, its leverage had increased to 1:3 in 2018.

So far, PASS Trust's guaranteed loans have benefited more than a million agricultural entrepreneurs and created more than 2.5 million jobs. Because of the availability of guarantee funds, it also attracts private equity investors to its projects (usually from 20 to 40 percent, and in some cases up to 80 percent). It has also improved market access for farmers— for instance, by using blended finance models in contract farming and offtake agreements, as well as by deploying the tools across different value chains.

select the most effective instrument(s). For instance, beyond downside protection through risk mitigation, blended finance could also enhance the yields (risk-adjusted returns) associated with these investments. The transition to sustainable food systems that is based solely on commercial capital may otherwise not generate a sufficiently attractive financial return to raise the requisite capital.

Blended finance transactions generally create a higher leverage ratio (the number of private dollars mobilized as a result of using concessional dollars for de-risking) through aggregation in the form of funds and facilities that pool together resources. They provide diversification for investors (a risk mitigation approach) and exposure to diversified assets, investees, countries, regions, and sectors and are therefore a preferred investment approach that can also help to attract larger volumes of financing for building resilient food systems. In Box 10.5, we illustrate, as an example, how the BUILD Fund Malawi combines loans, equity, and technical assistance, impacting agricultural productivity and promoting gender equality through targeted investments.

Aggregating pools of capital through funds, facilities, and investment vehicles can increase the supply of financing for smallholder farmers, given the high transaction costs associated with single, small tickets for traditional lending. Credit facilities can be structured using blended finance with a diversified capital stack that provides first- (and in some cases second-) loss protection to investors in the senior tranches, or they can be structured using a portfolio approach in which all investors have the same risk–return profile. This is exemplified, for instance, in the PASS Trust in Tanzania, which uses credit guarantees to bolster local financial institutions' lending capacities and enhance agricultural finance access (see Box 10.6).

Another approach to attracting private investment for extending small-scale loans is through asset securitization. This involves repackaging portfolios of cash flow–producing financial instruments (for example, loans) into securities or tradable capital market instruments for transfer to other investors. Securitization essentially converts non-liquid assets into securities. In the context of building resilient food systems, the proceeds of asset-backed securities could be invested in sustainable food projects, and the structuring process could be funded through blended finance (for example, grants, technical assistance, and first-loss cover). Securitization can also benefit from “greening” by highlighting the positive environmental impact from the use of proceeds. This could be especially attractive as investors seek more ESG-aligned investment portfolios. Two other benefits of

securitization for resilient food systems are (1) lower capital costs and (2) sustainable loans to food system value chain actors, beginning in the production phase.

## *Creating an Enabling Environment for Food Systems Adaptation Financing*

Innovative financing mechanisms can play a crucial role in mobilizing funds for climate action in African agrifood systems, but they require an effective enabling environment. In this section, we discuss the three building blocks for creating such an environment.

### Strengthening Coordination and Collaboration

Increasing the mobilization and deployment of climate finance for agrifood systems requires greater cooperation and collaboration among various types of actors (public and private) and at different levels (international, regional, national, and subnational). Better coordinating efforts of all actors can help prevent duplication, benefit from complementary knowledge and expertise, and maximize the impact of existing initiatives. As such, it helps optimize the use of available resources by designing new initiatives to address identified gaps, drawing from past successes and failures (Chiriac, Vishnumolakala, and Rosane 2023a).

In particular, stronger cooperation and greater synergies among development partners (for example, donors and development agencies), DFIs, and PDBs, as well as with local public and private actors and civil society networks, can foster the development of a pipeline of bankable projects anchored in the local contexts, which is key to catalyze transformative investments at scale and to transition to a green economy. An example of this approach is the Dutch Fund for Climate and Development, in which the Dutch PDB FMO works with the Netherlands Ministry of Foreign Affairs, the Dutch agency SNV, and other nonstate actors to implement investments in climate mitigation and adaptation. This cooperation provides an operational vehicle that spans the full investment life cycle, including project origination. A partnership approach can also help shift DFIs' focus from individual projects to portfolio approaches that encompass development and climate objectives, while facilitating investments (Karaki and Bilal 2022). Moreover, enhanced cooperation among DFIs can also help rationalize and harmonize taxonomies, policy conditionalities, and reporting

requirements, thus reducing the fragmentation of financing approaches and easing the burden on recipient institutions to access finance (Ahairwe and Bilal 2023; Malabo Montpellier Panel 2022a). Such an alignment would also help provide higher amounts of cofinancing for adaptation projects in agrifood systems.

Effectively mobilizing and deploying climate finance also depends on using the right mix of financial instruments (Mustapha 2022). While different instruments are needed to cater to the diverse needs of financial intermediaries and agrifood companies at different stages of maturity or with different risk profiles, their coordinated deployment is necessary to maximize synergies and achieve impacts at scale. As such, a robust financial ecosystem that supports agrifood actors encompasses a combination of investors and financial instruments, as well as their linkages: from business incubators that support companies in the very early stages with grants or concessionary loans to impact investors, private financiers, and commercial banks that can provide debt finance or equity investments once the enterprises reach a commercial level (D'Alessandro, Rampa, and Dekeyser 2022).

### Policy and Regulatory Frameworks

Addressing the financial gap for climate action in food systems, particularly for adaptation, also requires conducive policy and regulatory frameworks at the country and regional level.

First, there is a need to promote increased alignment of national climate and food policies to ensure coherence and consistency in objectives and implementation strategies (ECDPM 2023; Malabo Montpellier Panel 2022a). In particular, integrating agrifood system-related objectives (including nutrition) in NDCs and NAPs is key to effectively identify and prioritize adaptation actions and financing needs as well as track progress toward them (Malabo Montpellier Panel 2022a; Schulte et al. 2020). Alignment with regional strategies is also important: collaboration is needed to assess the regional distribution of climate finance flows and develop tailored strategies and interventions that address the unique challenges and priorities of each area (Galbiati et al. 2023).

Second, climate goals outlined in NDCs and NAPs should be translated into national and subnational investment strategies with a clear definition of the role of various players, particularly the private sector (Adeniyi, forthcoming), as well as an articulation of the needs, costs, incentive structures, and returns



on investments (Malabo Montpellier Panel 2022a). This would support a more targeted deployment of climate finance toward the effective implementation of country-led plans that effectively involve local actors (Mustapha 2022).

In addition, it is essential to employ bottom-up and decentralized decision-making methodologies to guarantee that adaptation efforts effectively cater to the requirements and needs of the most vulnerable communities. This approach aids in pinpointing high-impact and urgently required actions while enhancing transparency and local ownership of interventions, thereby addressing structural inequalities (Adeniyi 2023a; Malabo Montpellier Panel 2022a).

Third, while African countries may not be able to provide as much domestic public climate finance as is necessary (given debt vulnerabilities and limited fiscal space available), they can optimize the use of the available national resources, not only by renewing efforts to meet the Malabo Declaration targets (Malabo Montpellier Panel 2022a) but also by revising public expenditure—including by repurposing subsidies to promote the adoption of climate-smart and regenerative farming practices and to promote systemwide resilience by embracing a transition to a bioeconomy (Chiriak, Vishnumolakala, and Rosane 2023a; Malabo Montpellier Panel 2022a, 2022b).

Fourth, African governments can step up efforts to mobilize private sector finance by reducing the costs of doing business, improving the investment environment, and deepening local capital markets, as well as by using policy and fiscal tools and market-based interventions to reduce project-related risks and incentivize private sector investment (Malabo Montpellier Panel 2022a). Private sector capital requires coordinated institutional arrangements and stable investment environments where investors can rely on governments to maintain regulatory stability, enforce laws, and protect property rights, including intellectual and physical assets. Effective regulations and political stability will be particularly important in attracting foreign direct investment and building investor trust (Micale et al. 2018; Tall et al. 2021).

At the same time, donors and DFIs must be less risk averse with their grants and other concessional finance instruments and provide incentives for domestic lenders to deliver more affordable borrowing prices for farmers and agrifood SMEs for investments in climate-resilient practices (Perera et al. 2023), including through more systematic use of blended finance and guarantees (D'Alessandro, Rampa, and Dekeyser 2022), for which there is growing evidence of their significant leveraging potential (Mustapha 2022).

Last, African governments should promote national policies that support investments in agrifood systems and improve rural financial intermediation, such as those that support savings mobilization, expand the range of available collateral substitutes, subsidize digital financial channels in rural areas for improved financial access, scale up agricultural risk management tools such as insurance protecting producers against droughts, or promote a more prominent role for national PDBs (D'Alessandro, Rampa, and Dekeyser 2022; ECDPM, IFAD, and CDP 2022). In addition, integrated solutions that encourage microfinance institutions to invest in and lend to farmers and agri-entrepreneurs can improve agrifood value chains by enabling investments in digital tools and climate adaptation practices (Ahairwe and Bilal 2022).

## Capacity Strengthening, Data, and Evidence

Capacity strengthening and robust data and evidence are pivotal elements in fostering an enabling environment for bolstering the mobilization and deployment of climate finance within agrifood systems. In particular, enhancing the capabilities of national institutions to secure donor accreditation and access climate finance from multilateral institutions and global climate funds is imperative (Malabo Montpellier Panel 2022a).

Moreover, providing technical assistance and capacity-strengthening initiatives for local stakeholders, spanning from farmers to financial institutions and government agencies, can significantly enhance their proficiency in accessing and managing climate adaptation funds effectively. This support also aids in identifying and designing initiatives aligned with local adaptation objectives and developing feasible investment plans (Adeniyi, forthcoming).

Also, in the context of blended finance initiatives, technical assistance facilities that simultaneously support (1) the setup of the financial vehicles, (2) the capacity of local financial intermediaries, and (3) the capacity of the end beneficiaries to draw and implement viable business plans have a better chance of achieving tangible and lasting results. Technical assistance to the end beneficiaries, in particular, should go beyond access to finance and encompass a combination of services that support business growth and accelerate the development of investable opportunities. An example of this approach is provided by the Rural Kenya Financial Inclusion Facility, which combines a guarantee scheme and a debt instrument through which the International Fund for Agricultural Development invests \$15 million to alleviate the liquidity constraints of nonbank

financial institutions to stimulate green investments by smallholder farmers and micro-, small, and medium enterprises. The facility includes two technical assistance components, one targeting local financial intermediaries to help them expand agrilending activity and better monitor their portfolios, and the other targeting the clients/end beneficiaries (that is, agri-SMEs and smallholder farmers) with needs-based technical advice and financial literacy training (D'Alessandro, Adeniyi, and Rampa, forthcoming).

DFIs should also bolster their internal capacities to integrate climate and nature considerations into their portfolio of agrifood system investments. Simultaneously, local financial institutions should enhance their technical expertise in climate risks and relevant technologies for agrifood systems, ensuring effective adaptation and resilience strategies (Chiriatic, Vishnumolakala, and Rosane 2023a). Adequate specialist knowledge is also necessary to handle technical aspects linked to the structuring of financial instruments in the agrifood sector (for example, on tenures and repayment cycles of loans and availability of collateral substitutes, but also on environmental and social sustainability criteria and operational modalities of blended finance more broadly) (D'Alessandro, Adeniyi, and Rampa, forthcoming).

In tandem with capacity building, the availability of comprehensive data and evidence is crucial for informed decision-making and efficient resource allocation. Systematic tracking and disclosure of climate-related financing flows should be improved to ensure transparency, accountability, and effective progress measurement (Chiriatic, Vishnumolakala, and Rosane 2023a). This requires filling data gaps (especially for what concerns private sector financial flows) as well as harmonizing methodological and reporting inconsistencies at the domestic and international levels (GCA and CPI 2023).

Moreover, continued efforts to strengthen the business case for climate investments in agrifood systems are necessary to facilitate more and better climate finance flows within agrifood systems (Chiriatic, Vishnumolakala, and Rosane 2023a). In the context of blended finance, in particular, more emphasis should be placed on progress monitoring and reporting to provide higher accountability and transparency of blended funds and enlarge the evidence base on their impact. This could be supported by better digitalization of the blended finance schemes procedures—for instance, by managing their disbursements and operations through digital platforms that facilitate online transactions as part of the scheme implementation while also generating data about progress and impact (D'Alessandro, Adeniyi, and Rampa, forthcoming).

## Conclusion

Adaptation measures in agriculture and food systems are urgently needed to mitigate the adverse effects of climate change, reduce the continent's vulnerability to climate hazards, and foster the development of sustainable, resilient, and inclusive agrifood systems. Our analysis finds that current climate finance flows to agrifood systems fall significantly short of meeting Africa's requirements. The adaptation finance gap is particularly large when looking specifically at small-scale agrifood systems. Moreover, current climate finance flows inadequately address gender inequality and social exclusion. Addressing these shortfalls in funding demands concerted efforts from all stakeholders, encompassing both the public and private sectors, to ramp up funding for the climate finance needs of African agrifood systems.

Given the existing structural, institutional, and technical barriers currently constraining the effective mobilization and deployment of climate finance for agrifood systems at scale, this chapter explored innovative financing mechanisms that can fill the funding gap for climate action in African agrifood systems. It focused in particular on the application of blended finance instruments and their potential to catalyze private investment at scale by de-risking agrifood transactions or creating more attractive risk-adjusted returns that also deliver environmental and social benefits.

Our investigation reveals that the market structure, business models, and underlying sustainable food system transactions must align with the risk appetite and the regulatory constraints and fiduciary responsibilities of private investors in order to close the large funding gap. Efforts to increase overall climate finance toward building resilient food systems must therefore center on how best to commercialize the sector by improving its risk–return profile and better design financing mechanisms that are adaptable to the agrifood sector.

Fostering a conducive enabling environment is also essential for mobilizing and deploying climate finance at scale in African agrifood systems. That entails strengthening coordination among all stakeholders, crafting supportive policy frameworks, and prioritizing capacity building alongside robust data and evidence management.