

The case for Adaptation: Building a Climate-Resilient Agriculture in Africa



EDITORS' NOTE



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The Sahel Capital team is pleased to present the 32nd issue of the Sahel Quarterly, themed 'The case for Adaptation: Building a Climate-resilient Agriculture in Africa'.

The recent floods in Nigeria, wildfires across Algeria, and severe droughts in the Horn of Africa all have something in common: they tell the grim story of the consequences of global warming on the planet, with a scale and pace that have never been reached before. In this story, Africa finds itself at the forefront of the emergency, despite bearing the least share of responsibility for the origins of the climate crisis. The potential losses are huge for the continent, as projections estimate that climate change will cause as much as 2 to 4 percent annual loss in GDP in the region by 2040¹. Most significantly, the acceleration of climate risks poses major threats to agriculture and food systems. In a continent where more than 1 person out of 5 is still facing hunger², the serious consequences of climate change are disrupting the fragile progress toward food security.

Although mobilization, efforts, and funding flows are accelerating to reduce carbon emissions globally, it is now clear that they are not advancing fast enough to spare the world the effects of climate change, which will get worse with time. As the world must be prepared to cope with unavoidable climate impacts, especially in Africa, climate adaptation has become a central response to the way climate change is tackled. The essence of adaptation is to adopt the behaviors, practices, skill sets, and knowledge to address the short, medium, and long-term effects of climate change, thereby building resilience into the ecosystems for them to properly withstand the upcoming shocks. The case for adaptation is even more evident when comparing the cost of inaction to the cost of adaptation. In agriculture alone, the cost of action is estimated at USD 15 billion per year, while the cost of damages induced by disaster relief and recovery from catastrophic events with no adaptation measure can be as high as USD 201 billion³. Additionally, adaptation is not only critical to reducing the damages, but it also drives developmental benefits and supports a more resilient pathway toward Africa's growth. The recent COP 27 has given a strong signal about the importance of adaptation, by launching an Agenda for Adaptation that will be to enhance resilience for 4 billion people living in the most climate-vulnerable communities by 2030⁴. Agriculture is a key part of this plan, as one of the main targets includes a transition to climate-resilient, sustainable agriculture that seeks significant yields increase coupled with a similar reduction of farm-level greenhouse gas while improving livelihoods, especially those of small-holder farmers. Across the world, institutions, governments, activists, and businesses reaffirm the strategic priority of adaptation and bring to life some of the solutions for its implementation.

This quarterly aims to contribute to this movement by shedding light on some of the key topics surrounding adaptation in the agribusiness sector in Africa. After giving an overall picture of the key issues at stake with adaptation, we take a closer look at the different solutions available to build a resilient food value chain. As achieving adaptation goals implies focusing on food systems as a whole: the response touches on various solutions, from better infrastructure to food waste or small-scale producers' linkages to value chains. We then explore how different climate-smart interventions can be leveraged toward the objective of a climate-resilient Africa. Following this, we seek to understand the state of current climate adaptation finance flows to Africa and why they are not yet sufficient to meet growing adaptation needs. Our quarterly ends with a spotlight on two of Sahel Capital's portfolio companies, which both set an example of resilience in the face of unexpected events: we learn how Coscharis managed to overcome an unexpectedly high level of flood and adapt its farming systems, and how Dayntee crossed the hurdle of Covid 19 by reorganizing production and solidifying its out-grower scheme in a way that strongly aligns the company's and smallholder farmers' incentives. These two cases will shed light on how agribusinesses can be active to protect and develop their assets, workers, and smallholder farmers' livelihoods in the middle of the climate crisis. We hope that this read leaves you more informed and convinced of the importance of adaptation in combating the climate crisis.

1. Global Center for Adaptation, State and Trends in Adaptation Report 2021

2. FAO (2021). The State of Food Security and Nutrition in the World. Food and Agriculture Organization of the United Nations, Rome.

3. Global Center for Adaptation, State and Trends in Adaptation Report 2021. Calculations based on Nkonya et al. (2016); Alene et al (2010); Fenta et al. (2020); Fuglie (2018); Nin Pratt (2021) Venton et al. (2019); Ludwig et al., (2016); and various calculations.

4. <https://climatechampions.unfccc.int/cop27-presidency-announces-ambitious-climate-resilience-agenda/>

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WHY IS ADAPTATION CRITICAL FOR AFRICA?

BY TOSIN OJO

PRINCIPAL, SAHEL CAPITAL

Agriculture is Africa's mainstay. In Sub-Saharan Africa, agriculture employs 53% of the workforce and contributes 17.2%, on average to GDP¹. Africa also contributes significantly to global agricultural commodities output. From the export of tea, coffee, and ornamental plants from Kenya to Cote d'Ivoire's pole position in the global export of cocoa and cashew, Africa's agricultural activity accounts for some 9% of global agricultural commodities supply² and contributes 60% of forex earnings on average for Kenya, Ghana, and Cote d'Ivoire³.

Africa's agricultural output is primarily driven by the subsistence activities of smallholder farmers. These farmers account for 80% of agricultural production on the continent⁴. Despite its low contribution to global greenhouse emissions, Africa is the most vulnerable continent to climate change. The effect of climate change in Africa is and will be most pronounced on agriculture and food systems – given the centrality of agriculture, especially at smallholder farmers' level as economic activity and for food production. Africa is particularly vulnerable to climate change because 95% of agricultural activities on the continent are rain-fed and agriculture is a major contributor to the GDP of the countries in Sub-Saharan Africa.

From excess floods to drought, Africa is facing the collateral damage of climate change

Unfortunately, Africa is facing the collateral damage of climate change in its food systems. Without concerted and drastic actions, sub-Saharan Africa now faces a major food security crisis.

In West Africa, the Lake Chad basin region is home to about 20 million people from Nigeria, Chad, and Cameroon. More than 150,000 fishermen live on the lake's shores and its islands. Statistics show that the lake's surface area in the past 50 years has been reduced from its initial 25,000 km² to less than 2,500 km² due largely to its waters drying up. Environmental experts attribute this to increasing temperatures from global warming⁵. The implication of the shrinkage in the size of Lake Chad is multifold. It has led to environmental degradation, and social tensions with the migration of the fishing and farming communities around the Lake further south to find better opportunities.

Countries in West Africa are experiencing excess flooding from above-average rainfalls with the resultant destruction

of farmlands and agricultural output, which in turn has left millions displaced and worsened food inflation. In most West African countries, the price of popular staple food such as maize has risen by 106% in Ghana, 78% in Niger, and 42% in Nigeria, compared to their five-year average. "In Central African Republic, torrential rainfalls (starting in July 2022) drove flooding in Bangui, Bangassou (South-West) and Paoua (Northwest) prefectures affecting 35,000 people, destroying livelihoods and houses. Chad is experiencing the worst floods in 30 years, with 1 million people affected and massive damages to homes and croplands. A three-month emergency assistance was provided by the World Food Program, targeting 300,000 people. The pattern is similar in the Gambia, where torrential rains affected 109,000 people in suburbs. In Nigeria, since June 2022, floods caused by torrential rains have swept through 28 states out of the country's 36 states. The floods have affected 3.48 million people, led to many deaths, and destroyed 637,000 hectares



of cropland⁶.

East Africa is facing its worst drought in more than 4 decades which has resulted in a significant humanitarian crisis. After two years of below-average rainy seasons, many countries in East Africa are experiencing severe and persistent drought conditions which are leading to severe soil moisture deficit, with a negative impact on agricultural productivity and increased risk of wildfires. A total of 70 million people is exposed to drought risk in East Africa, and according to UN-OCHA, a total of 22.1 million people has been affected by drought emergency & need humanitarian help in Ethiopia, Kenya, South Sudan, and Somalia⁷. Over 8.9 million livestock which is relied on for sustenance by pastoralist families have died across the region. This implies

milk, according to the FAO. Drought has also led to significant spikes in food prices across the region. With reduced access to enough water, drought has increased the risk of diseases with cholera outbreaks – about 11,700 were reported between January – August 2022. Drought has worsened desperation for survival and increased inter-communal clashes and social tensions.



Climate adaptation is crucial

Efforts and spending have been focused on disaster relief. While disaster reliefs are necessary for the short term, they are unsustainable as they do not address the problem. New ways of thinking – that integrate climate-smart technologies and resilient practices into agriculture are required across the board – mer level. Climate adaptation in food and agriculture is essential to reaching the sustainable development goals. Studies have shown that effective adaptation measures are far less expensive than paying for repeated disaster reliefs. Research synthesized in STA21 shows that for Sub-Saharan Africa, the cost of action on climate adaptation and food systems is less than a tenth of the cost of inaction: US\$15 billion per annum compared with US\$210 billion per annum⁸.

To incorporate adaptation in agriculture and food systems, a paradigm shift is required at all levels from governments to multilateral agencies, donor agencies, associations, and organizations and to the individual smallholder farmer level. This will ensure that efforts are collaborative, and funding is geared towards the most impactful research and new technologies that enable climate adaptation. First and foremost, a timely convergence in thinking and policymaking about agriculture today is required, whether in the policy proposals of large multilateral institutions in the development or agricultural research space or in the agreements formulated at global forums like COP26, that emphasize the need to take a holistic approach toward issues of agricultural productivity, sustainability, and technological innovation. Then the deployment of cutting-edge science and technology at scale in areas such as plant breeding, genomic selection, pathogen resistance, and digital agriculture, is crucial to building adaptation in Africa's food systems. It is important to deploy funding to advance the research and science that enables

climate-smart agriculture. Key areas for sustainable climate adaptation in Africa include:

- **Genetic strategies for crop adaptation:** There are recent advances in genetic improvements with new sequence-based genomic tools that allow plant breeders to select and target specific traits in a more rapid and targeted manner. For example, gene editing, using CRISPR-Cas9⁹ allows precise and targeted changes in genes within crops that might not be possible with traditional breeding approaches. This advancement opens the possibility of using the genetic development of crops with relevant adaptative traits to abiotic stresses such as droughts, floods, and extreme temperatures resulting from climate change. Some efforts are underway in this regard and an important example is the \$40million initiative led by CGIAR in partnership with the Bill and Melinda Gates Foundation and the Foundation for Food and Agriculture Research to unlock climate-resistant traits from CGIAR's global collections to benefit smallholder farmers¹⁰.
- **Adaptation to abiotic stress:** In addition to the innovation of genetic strategies to develop crops with adaptative traits, a holistic approach is necessary for effectiveness. There are ongoing efforts that integrate local knowledge, traditional practices, and new technologies, to ensure the needed innovations are implementable on the field and at scale. For example, through the Feed the Future Innovation Laboratory for Crop Improvement Centers' three regional hubs in Africa (funded by USAID and leverages partnerships between Cornell University US, and African Scientists), smallholder farmers especially youth and women are empowered to move from subsistence farming to food and nutritional security using interventions across the whole value chain. The hub in East Africa (East African Center of Innovation in Finger Millet and Sorghum – CIFMS) in East Africa, is breeding new varieties of sorghum and finger millet resilient to abiotic and biotic stresses as well as containing improved protein and micronutrients.
- **Soil and plant health:** Healthy soils contribute to flooding resilience, nutrient cycling, and carbon sequestration. It has been estimated that 40% of the soils in sub-Saharan Africa are low on nutrients. The transition to climate-smart agriculture, which sustainably maintains or improves soil health, will be greatly enhanced by the reduction and/or removal of Nitrogen and Phosphorus fertilizers. The use of organic soil management practices is an alternative strategy – though it doesn't represent a holistic approach. It is important to deploy advances that can confer nitrogen-fixing capabilities in non-legumes, which will in turn help African farmers to manage plant nutrition more effectively and rely less on expensive fertilizers¹¹.

Since this will only happen in the long term, management practices that can accelerate the transition to sustainable practices are crucial and should be deployed. Examples of this include – the management of placement and timing of nitrogen fertilizer on maize crops using conservation practices that maintain production, using soil amendments such as biochar (charcoals) and microbial fertilizers.

- **Adaptation to biotic stress:** The advances in gene sequencing methods have enabled the possibility of developing broad-spectrum resistance to multiple variants of the same disease in crops. While this is yet to be adopted on a broad scale – there are efforts in specific crops to develop disease resistance. An example is the NextGen Cassava project, which, through new fast-forwarding screening methods has helped to identify resistant crosses in Cassava, resulting in the identification of seedlings that carry both CMD (Cassava Mosaic Disease) and CBSD (Cassava Brown Streak Disease) resistance. Through this project (which is funded by the Bill and Melinda Gates foundation and the UK Foreign Commonwealth and Development Office), a new cassava variety – Gamechanger Cassava is bred by the Institute of Tropical Agriculture in Africa (IITA) and Root Crops Research Institute in Nigeria. Gamechanger Cassava is resistant to CMD, CAD (Cassava Anthracnose Disease), and Cassava Mealy

bug, with moderate resistance to CBB (Cassava Bacterial Blight) and tolerance for Cassava Green Mite (CGM). Adequate funding is required to develop these initiatives at scale and make the seedlings available even to smallholder farmers.

Ensuring implementation at all levels

Current efforts around climate adaptation in agriculture need to be scaled and implemented across the board. Given the scale of devastation and collateral damage caused by climate change in Africa, considerable focus and attention need to be given to funding research, community/stakeholder engagement, and policy development at all levels, to adopt and scale already existing climate-smart interventions for adaptation in Africa.

1. [World Development Indicators](#)
2. [FAOSTAT](#)
3. [WTOSTAT](#)
4. [IFAD](#)
5. [African Development Bank Reliefweb 2022](#)
6. [Reliefweb2022](#)
7. [European Mission August 2022](#)
8. [Global Centre for Adaptation: State and Trends - 2022](#)
9. [Global Center for Adaptation](#)
10. [Global Center on Adaptation 2022](#)
11. [Global Center on Adaptation 2022](#)



SOLUTIONS TO BUILD A CLIMATE RESILIENT FOOD VALUE CHAIN

BY SOLENE PRINCE-AGBODJAN

PRINCIPAL, SAHEL CAPITAL

This article is a recap of the latest discussions and studies on the climate-resilient food value chain approach. It outlines the role played by current agricultural production systems in worsening climate change and shows the need for a reorientation towards climate-smart agriculture. It also shows the environmental impacts of agriculture and food systems; explores the intersection of climate change and global food security and makes a case for climate-resilient agriculture.

The Environmental Impacts of Agriculture and Food Systems

Over one billion people are nourished by farming systems comprising cultivation, production, processing, transport, packaging, storage, and retail. Today, agriculture occupies half of all habitable land. To feed the world's growing population, more than 30 percent of the food supply per capita has increased since 1961; the use of nitrogen fertilizers has risen by 800 percent; and 100 percent more water is utilized for irrigation. Yet, despite this exponential increase, current food production could still not solve the hunger problem.

Food systems are failing to meet both health and environmental goals. Advanced agricultural methods are threatening the health of the planet as the sector accounts for 16-27 percent of global greenhouse gas (GHG) emissions and contributes to freshwater pollution, soil degradation, and biodiversity loss.

In the 21st century, therefore, aligning food systems to achieve better environmental and health outcomes ranks among humanity's most important challenges.

Human activities and a warming world

Humans depend on the land for their livelihoods and well-being, including their supply of food, fresh water, and various other ecosystem services. Food contributes 26 percent of the global GHG emissions in which livestock (meat, dairy, eggs) and fishing account for 31 percent of total food-related emissions. Methane is a greenhouse gas that is produced during digestion, manure management, and pasture management. Crop production generates GHGs such as nitrous oxide which accounts for 27 percent of the food emissions. The food supply chain, which includes harvesting, food processing, packaging, and transport, accounts for 18 percent of total GHG emissions.

Food waste and GHG emissions

Food wastage arises from a variety of sources and depends on the local conditions in each country. In high-income countries, food losses occur in the production and post-harvest phases due to aesthetic preferences and arbitrary sell-by dates; in low-income countries, meanwhile, food losses take place during processing, distribution, and consumption. Combined with unfavorable climatic conditions, the lack of infrastructure, and inadequate knowledge of proper food storage and handling lead to food spoilage in low-income countries.

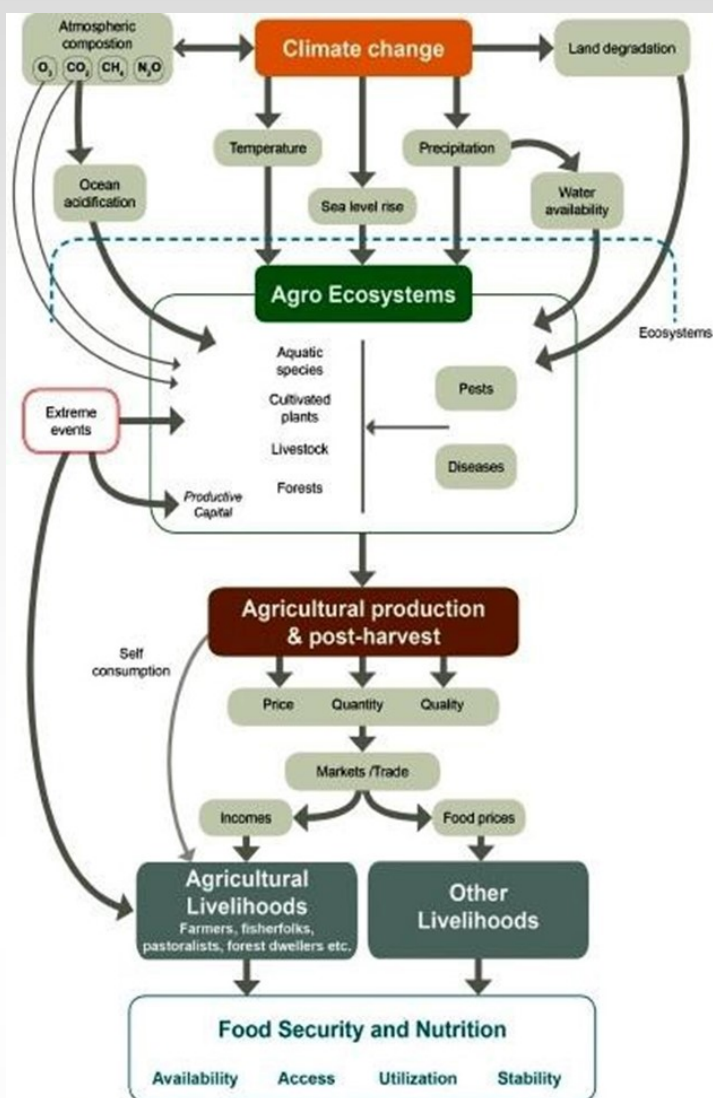


Sustainable Food Systems

As per the participants in the 1996 World Food Summit "food security exists when all people, at all times, have physical and economic access to adequate, safe, and nutritious food in quantities and varieties that meet their dietary needs and food preferences." This is supported by the availability of food, the accessibility of food, the proper assimilation of food into the human body and the stability of these three components. However, food security continues to be poor.

Climate change increases the risk of food insecurity in the most vulnerable countries and populations by affecting livelihoods and incomes in rural areas, marine and coastal ecosystems, and terrestrial and inland ecosystems.

The Cascading Effects of Climate Change on Food Security and Nutrition



Source: *Building climate-resilient food systems* (Suri & Ray, 22).

Farming has always been dependent on the whims of the weather. For tens of thousands of years, farmers have developed multiple skills to manage the various risks that accompany changes in weather patterns. These can be the extremes of droughts, erratic rainfall, strong winds, heatwaves, long gaps in between showers, the late onset of the rainy season, pest or disease infestations, and so on.

Climate-smart agriculture

Agriculture is a significant contributor to climate change, currently accounting for 19-29 percent of total GHG emissions. Part of the solution to build a climate-resilient food value chain is an integrated approach that brings climate-friendly practices to livestock and crop production. It can help reduce GHG emissions or increase carbon sequestration.

There are many other practices to support the implementation of a climate-resilient food value chain including organic farming, integrated pest management, and agroforestry.

Reducing the carbon footprint of modern diets

The first step to reducing dietary carbon footprint is to avoid wasting food. In landfills, food wastes decompose and release methane, a powerful greenhouse gas. Second, shifting to white meat such as seafood from red, or switching to vegetarian diets can dramatically reduce greenhouse gas emissions.

How Small Businesses Can Support Climate-Resilient Value Chains

Small businesses already support climate-resilient value chains (especially in developing countries) by developing new products and providing complementary services that reduce the negative impacts of climate change on their suppliers and clients. Investments in quality seeds by domestic seed companies are one such example. Domestic seed companies should facilitate more informed decision-making about seed choices; increase knowledge on the benefits of climate-resilient seeds; and strengthen systems for the production, distribution, and quality control of climate-resilient products and services through standards and partnerships.

Capacity-Building and Technical Assistance programs could support small businesses in the integration of climate risks into their decision-making (including in the use of climate and weather information) and help small businesses access climate finance.

Different opportunities exist to engage SMEs in the value chain. In addition to actions that reduce the vulnerability of their own business operations, the SMEs can develop and/or market new products and provide complementary services that reduce the negative impacts of climate change on their suppliers and clients. New products and services include, for example, innovative technologies (e.g., water-efficient technologies, climate-resilient varieties), climate-resilient infrastructure, risk management tools, improved climate information systems, and awareness toolkits for staff and clients.



Conclusion

The UN Food System Summit 2021 has urged the global community to focus on global efforts and contributions to transforming food systems. This calls for further research on developing evidence around the nexus of climate change, food security, and nutrition and the effectiveness of climate adaptation policies on food security and nutrition.

Food system sustainability can be addressed by adopting a sustainable agricultural system, shifting focus to sustainable eating, and finding ways to reduce GHG emissions at different levels of food production supply chains.

But, for one, there may arise “adaptation deficits” whereby present systems are not in a state to optimally adapt to the current climate. There are also “unavoidable damages” of climate change that cannot be overcome by adaptation, such as species extinction. There is also a possibility of “maladaptation”—erroneously adopting certain practices in the food system that will heighten vulnerability to climate change rather than mitigate it.

The recent emphasis on climate resilient systems is based on the assumption that it is in the best interests of the private sector to engage in climate change adaptation to reduce costs and stay profitable in the medium and long term. The SMEs are receiving increasing attention because they account for the majority of enterprises and employment globally and contribute substantially to GDP growth (ILO, 2015). They tend to be particularly vulnerable to the negative impacts of climate change in part due to their limited resources and capacities.

The SMEs remain the main investors in the agriculture sector in developing countries and play a key role in driving and shaping the development of agricultural value chains.

Consequently, they have the potential to direct their investments in ways that enable climate risk management by different value chain actors, while simultaneously reducing risks to their own bottom line.

Further, despite food systems in the countries of the Global South generally being more vulnerable to the risks of climate change, funding, research and development, and capital are relatively lower. A weak bargaining position for small-holder farmers, the lack of adequate access to infrastructure, and most importantly, the lack of a robust institutional framework to tackle rural problems hinder agricultural development in the wake of a looming climate crisis.

1. How Small Businesses Can Support Climate-Resilient Value Chains: Lessons from Uganda-IISD.org 9 Julie Dekens and Angie Dazé October 2016
2. Building Climate-Resilient Food Systems- Shoba Suri-Subhasree Ray August 2022
3. Summary for Policymakers — Special Report on Climate Change and Land. (n.d.). Retrieved June 17, 2022, <https://www.ipcc.ch/srcccl/chapter/summary-for-policymakers/>
4. S J Vermeulen et al., “Climate change and food systems. Annual Review of Environment and Resources,”. Annual Review of Environment and Resources 37(2012), <https://doi.org/10.1146/ANNUREV-ENVIRON-020411-130608>
5. Food and Agricultural Organization, “Climate-Smart Agriculture”, <https://www.fao.org/climate-smart-agriculture/en/>
6. Council of Energy, Environment and Water, “Sustainable Agriculture in India,” 2021 <https://www.ceew.in/publications/sustainable-agriculture-india>
7. World Resource Institute, “How to transform food systems in the face of climate change,” June 23, 2021, <https://www.wri.org/insights/how-transform-food-systems-face-climate-change>



BETTING ON CLIMATE-SMART AGRICULTURE TO REACH ADAPTATION GOALS

BY OLADELE SHEKETE

ESG DIRECTOR, SAHEL CAPITAL

At the recently concluded COP27 in Egypt, delegates agreed that the agricultural systems would have to change to adapt to climate change and improve food security.

With the growing world population expected to surpass 9.8 billion by 2020, the increased urbanization has further pressurized the demand for food supply. While smallholder farmers who are the most vulnerable to the effect of climate change contribute only 5% of the global emission, over 200 million smallholder farmers in Africa have been seriously hit by the effects of climate change amongst other challenges affecting food production in Africa.

The assessment of the Intergovernmental Panel on Climate Change (IPCC) shows that global climate change is already damaging crops and undermining food production capacity in most parts of the world, particularly in poor countries. Negative impacts on crop yields have been more prevalent than positive ones. Even worse, that is often the case for staple foods such as wheat and maize, which feed much of the global population.



Sub-Saharan Africa is particularly vulnerable to climate change. Estimates show by 2050, warming of just 1.2 to 1.9°C, well within the range of current IPCC projections, is likely to increase the number of malnourished in Africa by 25 to 95 percent – 25 percent in central Africa, 50 percent in east Africa, 85 percent in southern Africa and 95 percent in west Africa.

The West African region is marked by a strong dependence on rain-fed agriculture and natural resources, high levels of poverty, and limited infrastructure in rural areas. The region is projected to suffer further water stress, more frequent droughts, floods, and other alteration in rainfall patterns, leading to lower agriculture yields unless adaptation measures are taken.

Climate Smart Agriculture

Climate-smart agriculture (CSA) is an integrated approach to managing landscapes to help adapt agricultural methods, livestock, and crops to the ongoing human-induced climate change and, where possible, counteract it by reducing greenhouse gas emissions, at the same time considering the growing world population to ensure food security.

CSA has multiple components that when adopted together or independently have the potential to not only increase the quantity and quality of food produced but also ensure the sustainability of natural resources.

Climate-Smart Agriculture is guided by three main goals:

- Increased productivity - sustainably intensifying agriculture
- Enhanced resilience - adapting to climate change
- Reduced emissions - mitigating greenhouse gas emissions

Applying a holistic approach to agricultural development, CSA can target improvements in land and soil fertility management, water use and improved irrigation, crop and livestock variety development and choice, cropping pattern and calendar, and a combination of production systems e.g. forests, cropping, aquaculture, animal husbandry, etc.

Climate-Smart Agriculture does not define any new farming practices but rather highlights many practices that farmers already use which include,

- Use of organic fertilizer
- Conservation tillage
- Cover cropping
- Nutrient management
- Agroforestry
- other practices to reduce GHG emissions, production of Biochar

Steering these practices toward production, adaptation, and mitigation goals is what makes them Climate-smart; climate-smart farming sustains development while assuring food safety as climate changes. By implementing these practices, farmers will increase productivity and change their resilience to climate change.

Challenges of Climate Smart Agriculture in Africa

The impacts of climate change particularly droughts, floods, and other alterations in rain patterns, with their associated impacts on crop yields and livestock, are already being experienced across Africa, however, the promotion and uptake of CSA practices remain limited due to inadequate awareness and participation of the smallholder farmers in the policy formulation and decision-making process on the adoption of climate-smart agriculture.

All African countries have examples of both traditional and research-based agricultural practices that can be deemed climate-smart, but they are not mainstreamed in agricultural practices and still receive limited support. Such practices include both agroecological techniques (e.g. mulching, intercropping, agroforestry, mixed farming) and agricultural biotechnology, such as high-yield and/or drought-tolerant crop varieties and livestock breeds.

While most African countries have developed policies on agriculture and climate change that highlights the impact on Agriculture, those policies often lack instruments to achieve the goals they set.

Limited access to technology for scaling up CSA practices is also a major challenge in Africa, many CSA practices notably those based on biotechnology, machinery for conservation agriculture, or equipment for small-scale farming remain expensive and dependent on foreign actors. This reveals an urgent need to promote the endogenous technological development of Africa.

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The recent emphasis on climate resilient systems is based on the assumption that it is in the best interests of the private sector to engage in climate change adaptation to reduce costs and stay profitable in the medium and long term. The SMEs are receiving increasing attention because they account for the majority of enterprises and employment globally and contribute substantially to GDP

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Further, despite food systems in the countries of the Global South generally being more vulnerable to the risks of climate change, funding, research and development, and capital are relatively lower. A weak bargaining position for small-holder farmers, the lack of adequate access to infrastructure, and most importantly, the lack of a robust institutional framework to tackle rural problems hinder agricultural development in the wake of a looming climate crisis.



FINANCING ADAPTATION: ACCELERATING CLIMATE FINANCE FLOWS IN AFRICA

BY NOUSS BIH,

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Daily news constantly reminds us of the reality of the climate crisis and the toll it is taking on the lives of hundreds of thousands across the world. Africa is far from being spared by this unfortunate trend: on the contrary, African countries appear high on the list of the most vulnerable nations in the world. There is a consensus that climate-related shocks will be more acute and more frequent on the African continent.

While mitigation efforts have attracted a lot of attention, it has long been considered critical to act decisively on adaptation efforts. Since the Paris Agreement, world leaders have acknowledged the need to accelerate adaptation efforts, and the principle that developed countries should be at the forefront of the funding efforts toward adaptation has been agreed upon. COP 26 went further, with the announcement of financial commitments. However, the world's wealthiest nations have fallen short of their obligations, thereby reducing the ambitions of a much-needed adaptation.

The necessity to fund adaptation

Adaptation is critical to building resilience for the inevitable effects of climate change, on many levels, particularly concerning human lives and security. It is important to understand the implications from an economic perspective. The IPCC reports have established that climate change is already reducing economic growth and reversing hard-won gains in terms of economic development. The destruction of infrastructure and social consequences of climate shocks such as floods or hurricanes make these losses tangible. Additionally, this kind of event results in damage to assets, warehouses, and supply-chain disruptions. It also implies a reduction in productivity as it can affect the workforce's safety and integrity. These direct effects on means of production highlight the exposure of the private sector to climate change. Coincidentally, the banking system could experience a progressing deterioration of credit quality and even profitability.

The acceleration of climate risks requires that working to enhance adaptation becomes a common effort, from the government, private sector, and the financial system alike, to provide the right volume and type of financing and address the issues. Climate finance flows dedicated to adaptation have been on the rise for the past few years: from 30 bn USD in 2017, they have reached 46 bn USD in 2020. However, they remain insufficient given the magnitude of the need for adaptation.

According to the Adaptation Gap Report released by the UNEP, the volume of annual funding required to address adaptation needs would increase from 170 billion USD to 300 billion USD, and this figure could go as high as 500 bn USD by 205. This cost is particularly high in Africa, as the Global Center for Adaptation points out that floods, which are more frequent on the continent, are the climate events causing the most acute financial damage, although droughts are more frequent and affect a larger number of people. Behind the widening of this funding gap, there are two realities. On the one hand, although mitigation efforts are underway, the actual results to reduce the world's carbon emissions are very slow. There is growing consensus that the 1.5°C target established by the Paris Agreement is highly unlikely to be reached by 2030, as there is no credible pathway in place, and consequently, a more pressing need to build the necessary protection against the effects of the more frequent climate shocks. This means that adaptation costs are growing as fast as 5 to 10 times by 2030. On the other hand, adaptation still represents a limited share of global climate finance available globally, with an estimated 7% as opposed to 90% dedicated to mitigation. This number is a little higher in Africa, with a third of climate-related finance to Africa going to support adaptation efforts.



Taking a closer look at the status of African countries' needs, it is possible to calculate the funding gap based on an analysis of the Nationally Determined Contribution, which corresponds to the targets and commitment of each country in the fight against climate change. The aggregated funding gap for 51 countries amounts to an estimated 579 billion USD in adaptation finance, according to GCA, for the

current decade. This is to be compared to an available amount of 125.4 billion USD, or less than a fourth of the amount required. It must also be underlined that this average hides different realities within the continent, as some countries are particularly vulnerable and have more difficult access to funding.

Increasing the volume of funding for adaptation

In this context, it has become more pressing to ramp up the amount of funding going to African economies to face the challenge of adaptation. COP 26 recommendations were to at least double the commitments from 2016 to 2025, to achieve a fair balance between adaptation and mitigation efforts, but these recommendations have remained announcements. COP 27 has been credited with more success in this regard. First, adaptation was named a top priority this year. A historical landmark was achieved through the agreement to a Loss & Damage fund for the benefit of the most vulnerable countries. New pledges have been made to the Adaptation Fund, now totaling 230 million USD with a target to double adaptation finance adopted for consideration at the next COP 28. Although these achievements must be praised, the past trends in terms of disbursement inspire cautiousness. The focus must still be the disbursement of committed amounts if any real progress should be made.

Increasing the volume of investment dedicated to adaptation comes with many hurdles, especially in Africa. The acceleration of climate risks makes it inevitable and makes common sense for businesses. Data provided by the GCA shows that investment in adaptation can lead to a return on investment of 2:1 to 10:1. For example, investing in resilient infrastructure in Africa can provide a yield of up to 4 times, while investing in climate-smart crops in most African crops can generate between 2 and 14 times the cost of investment. However, the business case is not always obvious for businesses on the continent, for the reasons explained below:

- Calculating the direct return on investment related to adaptation can be difficult to achieve with precision. Providing a direct relationship to the benefit of an investment in adaptation with the return associated implies good availability of data and the ability to run reliable analyses.
- Additionally, data on climate risks is still not sufficient in Africa. Particularly, there is generally little understanding of the concepts of climate risks, and a lack of meaningful disclosure standards, such as strategy, risk management, metrics, or targets. Therefore, it is difficult to develop regulations and guidelines that would incentivize investors.
- As a result, regulatory guidelines for adaptation must still be developed, particularly concerning climate-smart agriculture. A robust body of regulations could either provide the incentive or the framework to demonstrate the benefits of adaptation.

- Additionally, the high costs of transactions in Africa are reducing the returns, therefore the perception of businesses is that additional concern on climate adaptation could result in higher costs.



Available solutions to fund adaptation

Due to these many barriers, achieving an ambitious goal in favour of adaptation finance requires a good understanding of the value added by financial instruments, and the risk appetite of each finance provider. Whether traditional instruments are used towards the funding of adaptation, or new instruments are built to address the issue, some of the most efficient is generally aligned with the features below:

- **Variety and Adaptability:** Financial instruments mobilized for climate adaptation must cater to different risk appetites and various goals of investors. Investors such as development finance institutions have the capacity to take up more risk due to their development mandates. These institutions being at the forefront of the global fight against climate change, have the volume of funds necessary, and can also assist governments to build capacity. Others, such as commercial banks, have less capacity to take on risk and will rely on projects with guarantees/collaterals or shorter tenors, or more predictable returns. Thanks to their risk appetite, multi-lateral institutions can fill a gap where commercial lenders would not otherwise invest, but with potential high benefits on adaptation.
- **Innovative:** traditional instruments don't always allow alignment of interests and investors' risk appetite. Technology and science surrounding climate adaptation are always evolving, and so is the involvement of the private sector, which is key to delivering scale and pace in the fight against climate change. Mobilizing the right actors with the right instruments implies to keep building innovative financial instruments, opening new sources of funding, and creating new structures.

- Built upon strong climate data: while designing financial instruments, the demonstration of the benefits or the returns must be made. It is essential for investors to be able to appropriately build the business case for these investments, to provide continuous incentives for

future investments, and increase the efficiency of adaptation

Below is an overview of the types of financing available for climate adaptation.

| | | | |
|--------------------------|---|---|---|
| Instrument | <ul style="list-style-type: none"> • Concessionary capital • First loss tranches • Project Preparation grants | <ul style="list-style-type: none"> • Blended Finance Instruments – catalytic funding using a mix of concessional capital and commercial funding | <ul style="list-style-type: none"> • Equity (high risk) • Mezzanine Debt • Project Finance • Bank loan • Bonds |
| Organization type | <ul style="list-style-type: none"> ○ Private Equity and Venture Capital ○ Institutional Investors (Sovereign Wealth Funds, Pension Funds) ○ Commercial and Pan-African Banks ○ Insurers ○ Large Corporations | <ul style="list-style-type: none"> ○ Multilateral Climate Funds ○ National Climate funds ○ Multilateral and Bilateral DFIs ○ Sub-Regional Development Banks | <ul style="list-style-type: none"> ○ Private Equity and Venture Capital ○ Institutional Investors (Sovereign Wealth Funds, Pension Funds) ○ Commercial and Pan-African Banks ○ Insurers ○ Large Corporations |
| Target | <ul style="list-style-type: none"> ○ Scale project ○ Offer volume of funding ○ Seek risk-adjusted return ○ Mainstream climate risk in investment decisions | <ul style="list-style-type: none"> ○ De-risk ○ Crowd in Private Finance ○ Validate business case | <ul style="list-style-type: none"> ○ Scale projects ○ Diversify sources of funding ○ Seek primary returns |



CASE STUDY: BUILDING CLIMATE RESILIENCE AT COSCHARIS

BY DEJI ADEBUSOYE
PRINCIPAL, SAHEL CAPITAL

Coscharis Farm Limited (CFL) is an integrated rice processing firm in South-eastern Nigeria, in a small town called Anyaku, Anambra state. CFL has an installed 36,000 MT capacity mill and a 2,500-ha rice farm that supplies rice paddies to the mill. The farm was extensively developed to cater to rain-fed and irrigated rice production. The company constructed over 14 km of primary and secondary canals to channel water from the adjoining Ezu river to irrigate the massive rice farmland. Despite this significant scale of canal development, the constructed canal can irrigate 600 ha of the available farmland.

CFL battles a significant flood crisis

While the Ezu river presents a considerable advantage to CFL in supplying the water required for its irrigation needs, it also compromises the integrity of the farm due to the rapidly changing climate situation, which leads to flooding. At the onset of the rainy season around March, the river remains at about 16 metres above sea level (ASL). At this level, the river holds more than enough water to commence farm irrigation and other uses for neighbouring communities. As the season progresses and the rainfall intensity increases, the river rises slowly, reaching about 21 metres ASL by the end of August. Ultimately in a regular season with average rainfall patterns, the river peaks at about 23 metres ASL between October and November. However, in some years, we have witnessed intense rainfalls that pushed the river to as high as 23.5 metres ASL. These are very high river levels, bearing in mind that the farm is barely at about 21 metres ASL. In extreme instances, like in 2022 and last witnessed ten years ago, the river goes as high as 27 metres ASL. These unique events are precipitated by the opening of the dam by the Cameroonian government to reduce the pressure of the rising water on the dam. Unfortunately, the released water flows into the Niger river, passing through Anambra state, to which the Ezu river is connected. As the river rises, it slowly submerges the dykes and flows unto the farm. The waters have risen as high as warehouse roofs, to put how high it gets in perspective.

In all these instances, barring any adaptation by CFL, the farm would be flooded and submerged. As a result, Sahel Capital, with the board, decided to be more proactive with a clear climate adaptation strategy. The board decided on this approach for a few reasons. First, south-eastern Nigeria is in a tropical region and would experience heavy rainfalls annually, and increasingly so with the changing climate.

There was no stopping it. In fact, the rain starts earlier and lasts longer. Secondly, Nigeria would need help to resolve the problem of opened dams by the Cameroonian government. This requires bilateral agreements and probably substantial capital investment to construct a dam along the Nigerian end. And CFL is not best positioned to resolve such bilateral problems between two sovereign entities. Hence, the decision to adapt CFL's practice to accommodate these changes and be better prepared.



Adaptation is a reasonable approach to addressing the flooding crisis.

CFL adopted three approaches in its adaptation drive. First, raise dykes on the farm, adjust planting schedules to accommodate the periodic flooding and harvest flood water for irrigation.

Building dykes around the farm seemed a decent approach with the rising river level. A dyke is a long wall or embankment built to prevent flooding from the sea. They are large mounds of sand or dirt gathered to form high barriers around an area. These dykes are usually built around farms, especially in areas susceptible to water ingress. To be done correctly, the dykes would be both high and wide – thick enough to ensure it does not collapse or bulge under the intense pressure of rising water. CFL built an 8.5 km flood protection dyke around the farm. These dykes were 15m wide and had to be built over several months, with considerable capital investment. The flood protection dyke was raised to 23.5 metres ASL. To put this in perspective, CFL built a wall that is as high as 13 men of average height standing on each other. And the wall is thick enough for a car to drive comfortably over it, with decent gaps on both sides – and 8.5 km long. This height was

predicated on historic flooding levels. If you recall, this is the water's height in extreme rainfall periods but not at normal rainfall levels. However, as explained earlier, there are unique instances in which the flood water rises above the 23.5 metres height of the dyke, breaches the dyke and floods the farm. While these were exceptional situations, they still destroyed crops and properties. This led to the second adaptation strategy.



If you are aware of the cropping calendar for rice in southern Nigeria, planting starts when rainfalls have properly started because rice requires lots of water for good performance. Most rice varieties are 90 – 120 days crops. So, if the rice is planted between April and June, the rice paddies would be harvested between August and October. The implication is paddies would still be on the field when the farm is most susceptible to floods. To further adapt to this risk, CFL decided to sequence its planting to ensure that there would be no crops on the field during those months with a high probability of flooding. In other words, we stopped planting in May to have no crops on the field by the end of September. You might wonder how the farm ever gets anything done with such a short planting window. The answer is CFL's irrigation facility. Because of this facility, CFL can commence cultivation much earlier than the setting-in of rainfall. So, once the flood waters recede by the end of November, the company prepares the farm for cultivation and planting by mid-December. This way, CFL plants continuously between December and May, allowing it to harvest some crops and replant without exposure to floods.

The third approach kicks in when the inevitable happens – there is a flooding event. After building the dykes, and tinkering with the planting cycle, there isn't much left to do than hope that there is no flood. However, if it floods, why let the water go to waste? CFL identified early that there it had flood plains on the farm. So it waits for the water to start receding. As soon as the tractors can drive on the farm, CFL raises the sand around the lake to retain water within the

lakes on the farm. Then it gradually releases the trapped water to irrigate low-lying fields by gravity. This concept results in dry season cultivation with zero pumping cost. In 2022, CFL irrigated over 8 hectares of paddy with harvested flood water and intends to expand that to over 50 hectares in the future.

Sahel's approach to adaptation

Farming in Africa must compete with various forces of nature, and unfortunately, if cultivation depends on solving these problems, the country will starve. Therefore, Sahel's approach to climatic change's impact on agriculture is to adapt sustainably and inclusively. Sustainably because whatever method pursued must make financial sense and be non-damaging to the environment. And inclusively because such strategies must not adversely impact the communities in those places.

The CFL model proves sustainable because its benefit outweighs the initial cost outlay and ongoing maintenance cost. It protects the environment from continuously degrading valuable topsoil materials to the crops grown. The model is inclusive because it not only protects the farmers in the community by presenting the first defence against the rising flood, but it also ensures that farmers from the community can start cultivating earlier and longer on the CFL farm as in-growers.



CASE STUDY: ADAPTING IN TIME OF CRISIS AT DAYNTEE

BY TOSIN OJO

PRINCIPAL, SAHEL CAPITAL

Dayntee Farm Limited Dayntee Farms Limited (“the company”) is an integrated poultry company, with breeding, broiler fattening and broiler processing operations. The company is a portfolio company of the Fund for Agricultural Finance in Nigeria (FAFIN) - a \$66 million agribusiness fund managed by Sahel Capital Agribusiness Managers Limited. FAFIN invested in Dayntee Farms in 2016, deploying growth capital to build broiler pens and broilers’ processing plant. Dayntee’s operations include breeding (breeder farm and hatchery), broiler farming/fattening and broiler processing operations. The company has a broiler pen capacity of 747,500 birds per annum and a broiler processing capacity of 5.3 million birds per annum. Due to economic challenges caused by Nigeria’s recession in 2017, Dayntee experienced a period of downturn, from which it began to recover in 2018, and further consolidated on this recovery in 2019, growing by 203% YoY.

meant that Dayntee would have to accommodate almost all its workers onsite to sustain the operation. It was not possible to accommodate all its workers on site – hence the company had to quickly figure out how to adapt by outsourcing certain aspects of its operations. The company kept the breeding and processing operations on the farm – and accommodated the workers within those divisions but outsourced its broiler farming/fattening operations. To do this, the company decided to change the model of its out-growers scheme – where smallholder farmers were paid a fixed management fee to raise DoCs (Day Old Chicks) to the required table size, on behalf of Dayntee, to a model where Dayntee buys back the birds, at the prevailing price based on the bird’s weightless input cost. This model essentially better-aligned incentives between the smallholder farmers (outgrowers) and Dayntee and led to a significant increase in the number of out growers onboarded. With this development, Dayntee was able to move almost its entire broiler farming/fattening operation to outgrowers’ within a few months – which helped sustain the availability of birds for its processing plant. The table below shows the proportion of birds processed by Dayntee sourced from out-growers versus its in-house pens between 2019 and 2020.

This change did not only help Dayntee sustain operations during Covid, but it also subsequently improved the company’s return on assets as the company could increase output without additional Capex.



Adaptation to Covid – 19 pandemic

The onset of the Covid-19 Pandemic posed a significant threat to Dayntee’s business performance. In the first quarter of 2020, the Nigerian government announced a complete lockdown and movement restrictions for about 2 months, because of the Covid-19 pandemic. During this period, all business activities essentially grounded to a halt except essential services – which included food production – hence Dayntee was able to continue operations.

However, with strict movement restrictions, it was nearly impossible for farm workers to commute to work daily as commercial transportation was not available. This difficulty



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SAHEL CAPITAL UPDATES

Sahel Capital Investor Conference



Sahel Capital hosted an Investor Conference from 22nd to 24th of November. This conference was held in person in Lagos, Nigeria and gathered the main investors in Sahel Capital’s maiden fund—FAFIN: KfW Development Bank, the African Development Bank, British International Investment and Nigeria Sovereign Investment Authority.

During the Investor Conference, Sahel Capital team presented an overview of FAFIN portfolio’s financial and operational performance, as well as their ESG and impact performance. The convening was also an opportunity to present Sahel Capital’s ambition and strategy for its second Fund, currently in fundraising stage. As part of the conference, the investors were invited to visit Trade Depot, the latest addition to FAFIN’s group of investees. Trade Depot has built a platform integrating actors in the trade value chain: manufacturers, distributors and small retailers. The visit covered the company’s main warehouse and a sample of clients, and gave great insights into Trade Depot’s operations and collaboration with Sahel Capital.

Sahel Capital Team Retreat



Sahel Capital’s team convened in Abidjan for the first annual retreat outside of Nigeria, where Sahel recently opened a new office. This retreat was the opportunity to participate in teambuilding activities and benefit from knowledge sharing sessions with the participation of renowned peers from the industry, both on the equity and debt practices. A full day was dedicated to an overview of the team’s achievements in 2022, as well as our strategy and targets for 2023. This retreat has filled the entire team with the energy and grit to face the challenges of 2023, and effectively deploy capital in the agribusiness sector in West Africa.

SAHEL CONSULTING RETREAT



In January 2023, the Sahel Consulting and AFC teams gathered at the Bolton White Hotel in Abuja to celebrate their 2022 accomplishments, discuss challenges and brainstorm solutions.

The team was highly engaged, and everyone had an opportunity to contribute to the strategic planning process.

While the retreat provided an opportunity to understand the organization's vision and road map for 2023, it also provided a wonderful opportunity for team building and collaboration, boosting rapport among team members in a most relaxing and creative environment. It was indeed a worthwhile time of reflection, refreshment, and renewal for the new year.

SAHEL CONSULTING SPEAKS

- **BMGF 2022:** Temi gave a presentation on ‘ALDDN’s Program Approaches to The Sub-national Level on 6th December 2022
- **4th Quarter National Seed Sector Platform Meeting:** Chinedu Agbara gave a summary of key findings of Donor Activities within the NSRM Framework on he highlighted the limited investments in infrastructure capacity for seed production and marketing. Mr. Agbara cited feedback from seed companies on their limited capacity to produce at scale seed varieties that farmers desire. Other gap areas highlighted include revenue generation for seed quality assurance, financial services, seed trade associations, and seed export on the 6th December 2022.
- **Solar-Powered Borehole Commissioning at Labbare Community:** Temi Adegoye gave a keynote address to commemorate the event on 13th December 2022.
- **World Economic Forum:** Ndidi Nwuneli spoke at a session convened by the United Nations Foundation; she highlighted the work done by Sahel Consulting and the African Food Changemakers on 18th of January 2023.
- **Impacting Gender & Nutrition through Innovative Technical Exchange in Agriculture (IGNITE) Research Summit:** Temi Adegoye spoke as a panellist highlighting the importance of technical assistance to create impact in nutrition or gender-sensitive programmes and the need for implementing organizations to set aside funds and resources for technical assistance on 23rd of January 2023.
- **ALDDN Livestock 247 Annual Retreat:** Hammed Jimmoh facilitated a training session on, ‘Effective Data Management in Animal Health Service Delivery. He emphasized on the importance of collecting credible data in animal health science delivery and how it can help in achieving the aim of the ALDDN programme in building a vibrant local dairy sector on 24th of January 2023.

SAHEL CAPITAL SPEAKS

- **Harvard Business School:** Mezuo Nwuneli was a panelist discussing Risk Capital in one of the module of Harvard Business School’s virtual course – “Food Systems Live! Entrepreneurship in Emerging Economies



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