CASA
Commercial Agriculture for Smallholders and Agribusiness

Investing in agriculture in the climate crisis: Considerations for investors and businesses from the CASA Programme

CASA, EPIC and Malabo Montpellier Panel

December 2021

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Commercial Agriculture for Smallholders and Agribusiness

The CASA programme is a flagship programme of the UK Foreign, Commonwealth and Development Office (FCDO) and is intended to increase global investment in agribusinesses which trade with smallholders in equitable commercial relationships, increasing smallholders' incomes and climate resilience.

The programme aims to help agribusinesses to scale up and trade in larger commercial markets. As part of its work CASA generate new evidence and analysis that supports a stronger, fairer and greener agribusiness sector.

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The Commercial Agriculture for Smallholders and Agribusiness (CASA) Programme aims to drive global investment for climate-resilient agri-food systems and increased smallholder incomes.

CASA partners with agribusinesses that source from thousands of farmers to help them identify and introduce climate-smart technologies and solutions, enhancing on-farm productivity and promoting business growth.

CASA provides inclusive technical assistance to larger agribusinesses with high potential to maximise their climate and socio-economic development impacts.

CASA collaborates with a broader range of investors and support stakeholders to identify and address evidence needs to make the case for increased investment in smallholder agriculture, climate resilience and nature-based solutions. CASA promotes a more enabling climate investment environment through events and analysis.

Summary

Smallholder farmers in Africa and Asia make very little contribution to global warming but are amongst the first to suffer the consequences of it. In this brief we provide insights for investors from the work of the CASA programme on investment opportunities and enabling policies for tackling climate change and its impacts in agriculture:

- Working directly with agri-SMEs in Uganda, Malawi and Nepal, CASA has supported the development of climate tolerant seed varieties and implemented business strategies that work to **support smallholder farmers to adapt to the effects of climate change**;
- CASA has developed digital tools to better understand physical climate risk at the country level and create climate appropriate solutions at the company level to **enhance the adaptive capacity** of agribusinesses;
- CASA research has sought to help financial institutions to assess, monitor and **report on climate risks** in their portfolios as well as proposing ways in which international transparency reporting systems can improve the inclusion of agriculture and adaptation.
- CASA research has also looked at potentially viable investment opportunities in Climate Smart Agriculture to support the **mobilisation of private finance towards the $100bn per year climate finance target;**
- In investigating contracts along the value chain, CASA has highlighted how empowered smallholders can make **more effective and sustainable agreements**, as well as engaging with the value chain actors that set key contractual terms, whether upstream or downstream;
- Digital technologies have the potential to transform agricultural systems through the **provision of reliable climate and market information** along the value chain and CASA has identified key roles for the private sector as well as future needs;
- Policy level guidance has focused on **low-carbon growth in agriculture**, including opportunities for decentralised renewable energy services for productive uses in agriculture, the role of livestock in both climate mitigation and adaptation of smallholder and pastoralist systems, and the potential for irrigation to offset many of the effects of a changing climate on farmers.

Context

Agriculture is the sector most vulnerable to the impacts of climate change. Yet globally, it is also one of the largest contributors to greenhouse gas (GHG) emissions, responsible for more than a fifth of all GHG emissions globally, and the greatest driver of biodiversity loss and destruction of natural habitats (IPBES, 2019). Climate-aligned investments in agribusinesses therefore need to build the resilience of enterprises to climate hazards and ensure that investment portfolios are low-carbon, while also understanding how nature-based solutions (NbS) can help preserve the value of investments in the agriculture sector and the natural capital upon which they depend.

Only a negligible proportion – approximately 0.1% – of tracked private climate finance is directed towards smallholder agriculture (Chiriac, Naran, & Falconer, 2020). To meet the $100 billion annual climate finance goal set at COP15 in 2009 and the net-zero GHG emissions by 2050 objectives set by many governments and companies, significantly more private capital needs to be mobilised. Increasing the availability of technical assistance for business operations would strengthen the pipeline of investment opportunities and thus improve access to finance for innovative enterprises (Casey, et al., 2021). **CASA is helping to address these needs directly through its investment facilitation, technical assistance and research work, outlined below.**

Enhancing agribusiness climate adaptation and resilience

CASA technical assistance for climate investment readiness

This support includes appraising potential adaptation strategies and climate-smart technologies that can enhance adaptive capacities at the business level. Advisory support improves both the investment readiness of agribusinesses and addresses their vulnerabilities to climate and environment risks.

CASA's Component A has been working to improve the investment readiness of agribusinesses with private investment potential in Nepal, Malawi, and Uganda, including:

- In Nepal, CASA technical assistance has facilitated increased investment in perishable food sectors such as dairy and vegetable products, seeking to minimise post-harvest losses at the farm level and food waste at the household level, while increasing profitability and investment readiness of the offtaker businesses themselves. Input providers offering climate-smart inputs, including vegetable varieties that require less water and input use, can now capitalise on climate adaptation opportunities and expand their market base;
- CASA supported another partner business in Nepal to distribute an improved variety of good quality tomato seeds to 400 farmers to build a supply chain with lower water and nutrient requirements;
- CASA is also supporting the introduction of technology to facilitate soil testing that will inform vegetable farmers in Nepal on the proper dose and use of agro-inputs. Technology and digital tools[1] help farmers through improved soil, nutrient and land management to characterise field conditions at a very fine level of detail. With this information they can select the right crops, use more precise amounts of water, fertilisers and other inputs to increase productivity and quality more efficiently. This reduces the use of inputs whilst also helping to lower contamination of soil and water sources;
- With CASA support, a dairy business in Nepal is supporting the establishment of collection centres with solar powered cooling systems to reduce milk waste without generating carbon emissions; and
- In Malawi's aquaculture sector, CASA is supporting a business which plans to invest in an indoor hatchery that will insulate them against any negative impacts of climatic changes. They have also invested in a carbon efficient transportation system using tricycles.
- In Uganda, CASA worked with agribusinesses in the beans and sesame sector to generate climate-relevant investment opportunities with the introduction of early maturing seed varieties that have better capacity to resist climate shocks;
- CASA also supported a partner business to develop pre-cooked beans which require less energy to prepare at the household level (energy that predominantly comes from burning firewood & charcoal), thus reducing carbon emissions[2]. This included training 1,700 smallholder farmers as producers and bulkers of the best bean varieties for the product;

[1] These digital tools are designed to provide location specific, on-time, tailored and actionable information (such as crop suitability, soil nutrition assessment, weather forecasting, improved seeds and integrated pest management) through mobile or web-based applications to farmers to help them select the right crops and use more precise amounts of water, fertilisers and other inputs.

[2] Pre-cooking beans under high temperature and pressure requires significantly lower amounts of fuel, thus having a CO_2 mitigation effect and may use cleaner fuels, such as Liquified Petroleum Gas (LPG).

To help investors to identify and prioritise climate finance investments as well as integrate climate mitigation and adaptation into business models, CASA's TA Facility developed a **portfolio level diagnostic tool for investors**. CASA's TA Facility applies this diagnostic tool in dialogue with investors to quantify the costs and benefits of initiatives. Although in its early stages, 60% of the investors with which the CASA TAF works have expressed interest in using the diagnostic tool. The approach is intended to help incentivise further investment by providing a clearer picture of the opportunity and incremental value that can be generated by climate- and nature-positive initiatives for agribusinesses and smallholder farmers.

- At the portfolio level, the tool generates a better understanding of relative risk, vulnerability and ability to adapt to the effects of climate change at the national level. This provides a method for **determining the exposure and risk of value chains to future climate conditions within current or future portfolios** and informs decisions on where to prioritise climate finance or technical assistance.
- At the investment level, robust upfront diagnostics assess specific climate risks that companies and their suppliers face, along with potential opportunities and costs and returns for both the smallholder and the agribusiness shareholder.

Insights from CASA research

Assessing physical climate risks

Understanding the risks posed by shocks exacerbated by climate change and slow onset hazards driven by climate change is crucial to mobilising investment in the right measures and technologies, as well as to avoid maladaptation. A review of physical climate risk assessment guidance frameworks led by CABI found that agriculture is rarely covered in specific detail, very little guidance considers financial provision in Asia and Africa, and that climate change adaptation measures are not integrated into climate risk assessment tools (Casey, 2021).

Work is now underway to develop new guidelines to improve and align the ways in which large financial institutions can assess, monitor, and report on climate risks to their portfolios, considering both physical and transitional risks. The outcomes of this work will help large financial institutions better understand and cost the risks and opportunities present within the agriculture sector and value and appraise the potential of adaptation technologies and interventions to lower climate risk sensitivity, and ultimately to increase their investments in sustainable agriculture.

Investment opportunities in climate-smart technologies

In 2021, CASA research with nearly 30 investors, innovators and intermediaries identified eight leading **climate-smart agriculture (CSA)** technologies which show significant investment potential as well as strong climate and development impacts for smallholder agriculture in Asia and Africa:

- Solar-powered drip irrigation
- Biocontrol products
- Solar-powered cold storage units
- Digital CSA advisory services
- Smart irrigation systems
- Bio-coatings for preservation
- Solar dryers and processing
- Biodigesters

CASA's research found that these technologies are able to reach scale and profitability through innovative business models. These include, for instance, hardware technology providers pivoting towards service provision and rental models to reach low-income clients,

the diversification of revenue streams from complementary services and brokering of financial products, and the bundling of multiple services through digital platforms which increases the 'willingness to pay' for the services among low-income users.

India was identified as a market with particularly rapid growth and investment potential for CSA technologies. Investors highlighted the lower barriers to entry, the greater scale of the market, the more advanced digital infrastructure and familiarity with mobile-based tools, and greater access to finance for smallholder farmers and agri-SMEs.

Key issues remain to be addressed to fully unlock the investment potential of these eight priority CSA technologies, and others. Improved access to finance for smallholders is vital to increase the ability for millions of smallholders across Asia and Africa to invest in climate-smart technologies. CSA technology innovators require both technical assistance and finance in the growth stage of their enterprises, to move beyond ideation and testing, to full-scale market reach. Critically, there is a need for greater awareness of CSA technology investment opportunities among investors. However, significant future opportunities exist in the latent demand for technological solutions to climate change from 450 million smallholders in Africa and Asia.

CASA's policy partners, the Malabo Montpellier Panel, produced an evaluation of **irrigation** expansion in Africa which concluded that irrigation can have multiple benefits that help to improve livelihoods and increase the resilience of smallholder farmers and their communities to climate change and food insecurity. The private sector has a crucial role to play in the design, development, dissemination and maintenance of innovative, smart irrigation technologies that are locally adapted and improve smallholder farmers' productivity and livelihoods. In parallel, increased investments in technologies, supportive infrastructure, and energy provision – adapted to local production systems – are essential to enable a sufficient water supply for crop production and an expansion of land under irrigation.

Another report from the Malabo Montpellier Panel highlighted that more investment is needed to develop digital tools and services that address the persistent climate challenges across the agriculture value chain. **Digital technologies** have the potential to transform Africa's food systems, improving access to reliable information on market demands, land use and weather forecasting that reduce post-harvest losses and increase production efficiency in the face of a changing climate. Development of tools and services could be financed through accelerator and innovator funds. The private sector can contribute through service provision, technology development and commercialization.

In a separate report, the Malabo Montpellier Panel explored how innovative business and payment models offer investment opportunities that bring **improved energy services** to smallholder farmers in remote and rural parts of Africa. For instance, mini-grid and off-grid solutions now integrate additional services such as remote monitoring, Uber-like scheduling, mobile money, and various pay-as-you-go models, including rent-to-own, leasing, service for fee, and agricultural extension support, to ensure that costs are covered and enterprises remain viable.

Reliable energy services provide the power required for farmers to use climate adaptation technologies such as irrigation systems and digital monitoring and information systems. Crucially, it also provides the opportunity for companies providing cold storage solutions to operate, meaning produce can be stored safely and for longer periods, avoiding waste and improving profits. Solar water pumps have a potential market of $1.6bn from the current $500m, demonstrating the sizeable investment opportunity that exists in climate-smart agricultural technologies. Investments in infrastructure must therefore be matched with programmes to accelerate the uptake of agricultural machinery and technologies that rely on energy.

Financial services must be (re-) designed to cater for the unique circumstances of livestock producers, such as the need for different loan sizes and duration of borrowing, alternative

forms of collateral, seasonality of production, and other inherent risks. Livestock insurance also provides a vital source of financial support, particularly during and following emergencies and extreme weather shocks exacerbated by climate change.

Equitable contracts

CASA aims to ensure equitable outcomes for all smallholder farmers can be achieved through its interventions. Farmer-focused research led by IIED elaborated the importance of fair contracts in ensuring sustainable business relationships along the value chain. By supporting farmer agency in contracting, investors can create more equitable and sustainable arrangements for commercialising smallholder agriculture. This supports the building of resilience and adaptive capacity for the farmer - so that they are not locked into adverse contractual arrangements - whilst bringing sustainable, long term delivery from satisfied farmers.

Conclusions and way forward for CASA

There is increasing interest within capital providers for understanding and addressing impacts on climate and nature from investments. CASA endeavours to advance this positive direction of travel through its technical assistance and investor engagement work, to promote climate change mitigation and adaptation and the greater consideration of nature-positive farming systems.

To meet the targets of the Paris Agreement, the finance and agriculture sectors need to transition rapidly. This includes measures to support the achievement of both public and corporate net-zero emissions targets, the mobilisation of at least $100 billion per year in climate finance, enhanced climate risk assessment processes in agriculture, and moves towards more resilient and nature-positive production systems.

The role of CASA needs to include not only consulting the sector to define information needs, but to be proactive in engendering comprehension of these concepts and their potential to impact on the finance available for agricultural investment in Africa and Asia.

Future considerations for engagement with CASA's private sector investor partners therefore include:

Mobilise climate finance

- **Demonstrate the viability of impact-focused commercial investment models for CSA and raise awareness of CSA technologies** – many of the current investment models and technologies remain nascent but progress is being made, with an opportunity to stimulate investment by examining new investment possibilities.
- **Further research on innovative business models for CSA** – building on work already completed, there is significant potential for further research on existing models to improve investability.

Adapt to climate change pressures

- **Improve climate risk assessment guidance and tools** – with much of the sector either emergent or entirely new, knowledge within both investors and agri-SMEs is limited. CASA has a role in supporting the development of common understandings and standard tools.
- **Technical assistance for the under-served middle of agribusinesses to identify and respond to CSA challenges and opportunities** – a key finding from CASA's research as well as others in the sector is that agri-SMEs are substantially excluded from formal advisory, regulatory and other support infrastructures for a range of reasons. Ensuring that these actors, which represent a significant proportion of

intermediaries in smallholder agriculture, have access to and understanding of CSA based financing schemes will improve access.

Mitigate GHG emissions

- **Identify the technologies and business models necessary for low-carbon growth in the agriculture sector** – agricultural soils have the potential to act as a significant carbon sink, while improved technologies and practices can reduce GHG emissions from on-farm production, and improvements in post-harvest value chains can minimise food waste.
- **Explore certification schemes for nature-positive agriculture to improve monitoring reporting and verification** – measurement and verification is a core part of ensuring change can be quantified to form the basis of either a compliance or results-based investment model. New systems will emerge that need to be reviewed for effectiveness and disseminated to CASA's partners.
- **Research on commercial investment opportunities in NbS** – whilst smallholder farmers are the key focus of CASA, the major contributor to biodiversity loss and nature destruction are large scale commercial farming enterprises producing mono-crops under heavily mechanised and chemical dependent agricultural systems. Understanding how these systems can be positively affected by NbS not only improves the potential to impact on biodiversity loss at scale but it identifies approaches that could be expected to be transferrable to the smaller farmer in due course.

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