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IMPROVING THE QUALITY OF INVESTMENT IN AFRICAN AGRICULTURAL ADAPTATION

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High-quality investment in agriculture research, development, and deployment (RDD) is needed to deliver climate resilience across Africa. Innovation in technologies, business models, and policy is critical to tackling emergent threats to food system resilience.

To adapt to climate change and achieve zero hunger, Africa and the Middle East will require at least $1.7 billion more annually in high-quality finance for RDD in the agriculture sector.[1] COP27's Adaptation, Agriculture & Food Systems, and Land Day offers an opportunity for:

1. The outgoing UK COP26 Presidency and incoming Egyptian Presidency to support initiatives launched at COP26 with a focus on accessibility of investment in RDD for innovation.
2. Governments and finance providers to emphasise that addressing climate change and helping farmers adapt will be crucial to improving global food and nutrition resilience.
3. The UAE and USA as co-Chairs of the Agricultural Mission for Climate to encourage finance providers to invest in agricultural innovation sprints that benefit African smallholder farmers. They should also promote quality investment through engagement and alignment with African priorities.

The annex to this briefing showcases agriculture adaptation projects, providing examples of previous investments in African agricultural adaptation across sectors and geographies.

[1] IFPRI, 2021, **Climate Change and Hunger**

The climate front: adapting food systems in Africa

Since 1961, climate change has reduced growth in agricultural productivity by 34%.[2] By 2050, staple crop yields in some African countries will decrease by as much as 80%.[3] Climate change presents multifaceted challenges for the productivity and resilience of agricultural systems in Africa including water scarcity, new and migrating pests, and degraded soil health.[4] This hinders Africa's ability to ensure domestic food security and secure livelihoods.

While not a silver bullet, innovation can play a critical role in helping farmers to adapt to climate change. As climate impacts worsen, science-based, locally led innovation for adaptation will become increasingly essential for community, sectoral, and economic resilience.

The case of the missing investment

Africa faces a significant finance gap for research, development, and deployment (RDD) for agricultural adaptation. The Global Center on Adaptation[5] (GCA) estimates that African countries will face a $265 billion gap in financing for adaptation overall up to 2030, even accounting for the contributions expected from African governments.

Only $6 billion was tracked in adaptation finance to Africa in 2017 and 2018. Furthermore, climate finance from multilateral banks directed to agriculture and land use in Africa (both mitigation and adaptation) halved from $2 billion in 2018 to $1 billion in 2020, as seen in Figure 1. As well as being inadequate in volume, this financing has been subject to much variability making long-term planning difficult.

For agricultural RDD specifically, the Commission on Sustainable Agriculture Intensification (CoSAI) found that $1.7 billion more in international finance is required per year, up to 2050, for Sub-Saharan Africa and the Middle East and North Africa to adapt to the impacts of climate change and achieve the goal of zero hunger. That is a 50% increase on the reference investment scenario.

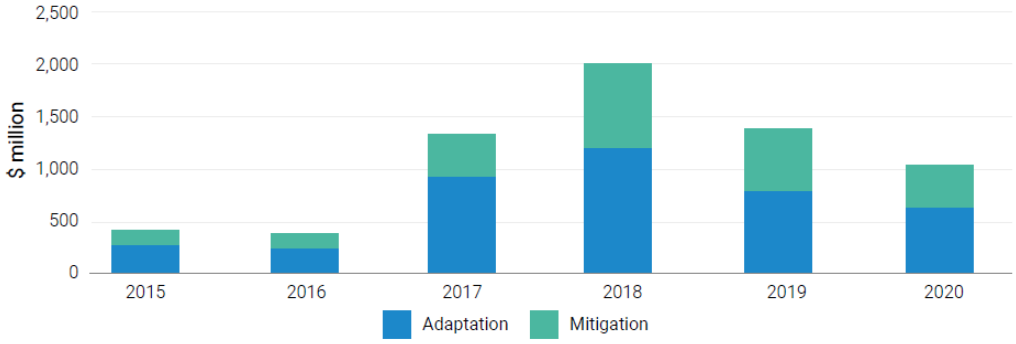
[2] IPCC, 2022, **Climate Change 2022: Impacts, Adaptation and Vulnerability**

[3] IFAD, 2021, **What can Smallholders Farmers Grow in a Warmer World?**

[4] GCA, 2021, **State and Trends in Adaptation Report**

[5] GCA, 2021, **State and Trends in Adaptation Report**

Figure 1: MDBs' climate finance flow to agriculture and land use in Sub-Saharan Africa from 2015 to 2020 ($ million)



Source: Global Center on Adaptation, 2021, State and Trends in Adaptation Report 2021: Africa

Improving impact: locally led adaptation and aligned RDD investments

To build climate resilience in Africa, this gap must be met with high quality investments in science-based, locally led innovation for adaptation. Table 1 outlines a small selection of on-farm, value chain, and policy adaptation solutions and innovations.

Table 1: Climate change adaptation solutions for African food, land, and water systems

Category	Examples of adaptation solutions and innovations
Public policy and incentive solutions	> Ramp up and coordinate support to research and extension services. > Strengthen inclusive climate information and risk management services. > Deploy adaptation policy; finance adaptation; maximise mitigation.
Food value chain and livelihood solutions	> Provide and maintain adaptative climate-resilient infrastructure. > Create demand for affordable, healthy low-carbon diets. > Link small-scale producers to value chains.
On-farm and productive landscape solutions	> Restore land and practice sustainable land management. > Scale up context-specific climate-smart soil management. > Monitor and manage new trends in pests and diseases. > Promote diversification of crops; develop climate-resilient genetic crop varieties; incorporate perennial crops, including agroforestry.

Source: Adapted from GCA, 2021, State and Trends in Adaptation Report, 2021: Africa; SoAR, 2018, Developing Global Priorities for Plant Research

These solutions have the most valuable impact for users when developed in close partnership with farmers. This can, in part, be achieved by investing in local research capacity and patents, where relevant. Impact can be further improved if new technologies and other innovations are developed with farmers and focus on farmers' needs and capacities. Alongside this, substantial and systematic training for extension and advisory agents will be crucial in bridging the gap between RDD and farmers' fields, and in improving the adaptability and resilience of smallholder farm operations.

High-quality funding for agricultural adaptation RDD is predictable, well-coordinated, long term, and aligned with the plans of recipients. Grants from the public sector and international funders will be a key source of this high-quality funding for agricultural adaptation innovation.

To support an ecosystem of actors and institutions, foster co-creation of adaptation solutions with end users, and further deployment and adoption of innovations, investments must support achievement of continental priorities and frameworks such as the:

> African Union Commission Climate Strategy

> African Union Commission Green Recovery Action Plan

> Science Agenda for Agriculture in Africa (SAAA)

> Goals for food security and resilience in CAADP and Malabo Declaration

> Science, Technology, and Innovation Strategy for Africa (STISA)[6]

For example, the Forum for Agricultural Research in Africa (FARA), an apex organisation for African sub-regional agricultural research organisations and a technical agency of the AUC, has set out steps for upscaling climate-smart agriculture in Africa[7] and launched a consultation on the African Climate Smart Agricultural Framework. This presents an opportunity to align investments in agricultural adaptation innovation with core priorities of the AU ahead of and beyond COP27. Priorities include transforming the agricultural system for prosperity, ensuring food and nutrition security, and building resilience to the climate crisis.

[6] AU, 2022, **African Union Climate Change and Resilient Development Strategy and Action Plan**; AU, 2021, **African Union Green Recovery Action Plan**; FARA, 2014, **Science Agenda for Agriculture in Africa**; AU, 2014, **Malabo Declaration**; AU, 2020, **Science, Technology and Innovation Strategy for Africa 2024**

[7] FARA, 2021, **Upscaling CSA adoption in Africa**

Beyond supporting continental frameworks and programmes, resources for agricultural adaptation at the local, national and regional level will also be critical. In 2021, the Africa Research and Impact Network and UK Research and Innovation co-hosted a series of workshops to highlight ongoing adaptation and resilience research based in Africa. They identified key areas to increase the impact of research funding[8]:

> Further investment in human capital in national agricultural research institutes (NARIs) and academic research centres to ensure sufficient research budgets and expanded capacity.

> Support networks of research producers and users, further developing knowledge exchange systems and practices. This could be accomplished via expansion of the funding available to the sub-regional agricultural research organizations (CORAF, ASARECA, CCARDESA, and NASRO).[9]

> Coordinate externally sourced finance around agendas set and owned by African institutions, governments, communities, and farmers.

[8] UKRI, 2021, **Tackling climate change: adaptation and resilience opportunities**

[9] DFID, 2019, **Strengthening Research Institutions in Africa: A Synthesis Report**

Conclusion: making quality investments in RDD for agricultural adaptation in Africa

There is an urgent need for immediate action and long-term investment to support African agricultural systems to adapt to climate change and global food system disruptions. COP27 offers a chance to marshal resources to equip Africa's farmers to adapt to the otherwise devastating effects of climate change.

All commitments made, reviewed, or updated at COP27 should:

> Ensure a strong focus on the quality of investment in RDD for innovation.

> Align with African priorities and frameworks.

> Recognise and take steps to ensure best practice is prioritised in engaging end-users in the conception, design, execution, and testing of innovation.

With these guiding principles, COP27 offers an opportunity for:

4. **The outgoing UK COP26 Presidency and incoming Egyptian Presidency to follow up on the initiatives launched at COP26** with a focus on the relevance and accessibility of investment in RDD for innovation.

5. **The Adaptation, Agriculture & Food Systems, and Land Day on the main stage at COP27 to emphasise that addressing climate change and helping farmers adapt will be crucial to improving global food and nutrition resilience.** Finance providers should also highlight finance for agriculture adaptation, given the priority given to the agricultural sector by National Adaptation Plans published by African governments.

6. **UAE and USA as co-Chairs of AIM4C to encourage finance providers to promote agricultural innovation sprints that benefit African farmers.**[10] They should urge AIM4C member governments to support sprints where private investors are less likely to invest such as those focused on smallholders and adaptation. The co-Chairs must also promote quality investment through alignment with African priorities and engagement with key stakeholders.

Beyond COP27, national governments and international funders must maintain or expand funding for RDD through traditional financing mechanisms and instruments. Funding should support existing institutions such as NARIs, SROs, FARA, university and the CGIAR networks. The aim: to expand the focus on

[10] E3G, 18 February 2022, **Innovation for agricultural adaptation**

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climate-resilient agriculture financial support and mechanisms to support longer term RDD.

ANNEX: Responding to climate change in African agriculture – examples of action

Climate change threatens livelihoods and food security in Africa – especially for rural and farm-based people. Adaptation to climate change requires altering patterns of farm production such as shifting to production of more drought resistant crops. It will also require the development and adoption of new techniques including more efficient ways to capture water and new technologies such as drought resistant plant varieties, or use of groundwater sensors to govern application of irrigation water. Such changes and developments are already happening (and in some cases, have been for several decades) – many successful.

However, far more will be needed. Below, we describe several examples of successful ongoing initiatives relevant to adapting to climate change in African agriculture. These examples aim to provide concrete illustrations of the types of investments and changes that are both needed and possible – and which require intensification and scale-up.

Improving plant genetics (Drought Tolerant Maize for Africa)

Angola, Benin, Ethiopia, Ghana, Kenya, Malawi, Mali, Mozambique, Nigeria, Tanzania, Uganda, Zambia, Zimbabwe

Initiatives and outcomes

Agricultural research develops improvements in plants themselves to make them more productive and resilient to environmental challenges. CGIAR works – through the International Maize and Wheat Improvement Centre (CIMMYT) and International Institute of Tropical Agriculture (IITA) – with African national agricultural research institutions across the continent on drought tolerance in maize.

The Drought Tolerant Maize for Africa project is an example of modifying plant genetics to address challenges associated with climate change such as higher temperatures and less rain. This research, development and deployment effort had, by 2012, produced and distributed three dozen new maize varieties that

improved yields by a third and outperformed traditional varieties in both drought and good rain conditions.

The research and investment activity was accompanied by: agricultural extension support for the adoption of the new varieties; and technical assistance for the development of enhanced effectiveness of seed distribution channels. Estimates suggest overall benefits of nearly $1 billion across as many as 20 million people.[11]

Funders and partners

Agronomic Research Institute of Angola,
Bill and Melinda Gates Foundation,
CGIAR,
Capstone Seeds South Africa,
Chitedze Agricultural Research Station (CARS),
Eiselen Foundation,
Ethiopian Institute of Agricultural Research (EIAR),
Germany's Federal Ministry for Economic Cooperation & Development (BMZ),
Howard G. Buffett Foundation,
International Fund for Agricultural Development (IFAD),
International Institute of Tropical Agriculture (IITA),
International Maize and Wheat Improvement Center (CIMMYT),
Kenya Agricultural & Livestock Research Organization (KALRO),
Kenya Seed Company,
Malawi's Ministry of Agriculture, Irrigation, and Water Development,
Mali's Institute of Rural Economy (IER),
National Institution of Agricultural Research of Benin,
Obafemi Awolowo University (OAU),
Savanna Agricultural Research Institute (SARI),
South Africa's Council for Scientific and Industrial Research (CSIR),
Swiss Agency for Development and Cooperation (SDC),
UK Foreign, Commonwealth and Development Office,
United States Agency for International Development,
University of Nairobi (UON),
University of Zambia (UNZA)

Water harvesting and watershed management (Wellness and Agriculture for Life Advancement Program)

Malawi

[11] CIMMYT, 22 October 2013, **Partnerships lead to measurable impact for Drought Tolerant Maize for Africa**

Initiatives and outcomes

Drought is one of the most important challenges faced by farmers as a result of climate change. This is especially true in areas with significant slopes where runoff and erosion contribute to water loss and low soil fertility.
A Catholic Relief Services-led program in Malawi – the Wellness and Agriculture for Life Advancement Program (WALA) – helped farmers and communities in such geographies in southern Malawi to apply water harvesting and watershed approaches to reduce these problems. Technical assistance, capacity building, and financing were made available to farmers and their communities to develop: watershed trenches, stone bunds, check dams, marker ridges, and re-forestation of denuded areas.

Ex-post evaluation of WALA found that crop yields and income increased as a result of the watershed management activities undertaken under the project, as did soil carbon and other soil nutrients. Local water tables rose, and the availability of surface water and stream flow increased. WALA-participating communities that undertook watershed restoration work were also more resilient in the face of drought. These communities did not require emergency food assistance during such episodes. By contrast, neighbouring communities that had not implemented similar practices and investments needed significant amounts of imported food aid during episodes of drought.

Funders and partners

ACDI/VOCA,
Africare,
Catholic Relief Services (CRS) Malawi,
Chikwawa Catholic Diocese (CCD),
Emmanuel International (EI),
Project Concern International (PCI),
Save the Children (SAVE),
Total Land Care (TLC),
World Vision International (WVI)[12]
USAID Office of Food for Peace,

Funding

The WALA Program was a five year $80 million Multi Year Assistance Program (MYAP) funded by USAID's Office for Peace (FFP).[13]

[12] USAID, 2019, **Long-term impact evaluation of the Malawi Wellness and Agriculture for Life Advancement Program**

[13] USAID, 2014, **End-line survey report CRS Malawi WALA Program 2009–2014**

Soil fertility management (Conservation Management Project)

Malawi

Initiatives and outcomes

In many parts of Africa, the effects of drought are exacerbated by degraded soil structure and depleted soil fertility. With technical assistance from the NGO Total LandCare and CYMMIT, farmers participating in field trials in Malawi have experimented with new soil fertility management techniques that diverge from traditional ridge tillage systems.

The approaches employed built from the simple principles of: minimum soil disturbance (reduced or no tillage); maintenance of soil cover (leaving crop and weed residues on the field – no post-harvest burning of fields); and crop rotations and intercropping (including introduction of legumes).

Participating farms have enjoyed a variety of benefits including: improved maize yields (10–70% – even in years of low rainfall); improved moisture retention from rainfall; increases in soil organic matter and improved soil structure; improved bioecology of the soils; an extra crop; reductions in pests and diseases; and labour savings (freeing family members to expand engagements in off-farm employment).

Funders and partners

CYMMIT
Department for International Development (DfID)
Royal Norwegian Embassy Malawi and Zambia
Total LandCare
USAID

Funding

The Conservation Management Project received a total of $8.5 million in funding over five years.[14]

[14] CGIAR, 2014, **Evidence of impact: Climate-smart agriculture in Africa**

Regional Sahel Pastoralism Support Project – PRAPS

Burkina Faso, Chad, Mali, Mauritania, Niger, and Senegal

Initiatives and outcomes

Livestock farming provides a livelihood for more than 20 million people in the Sahel. These pastoralists and their families migrate each year in search of water and pasture for their herds. This traditional movement has benefitted the pastoralists' herds, pasturelands, and farmers' fields. However, pastoralists have had to change the timing and location of their movements. Climate change makes water scarcer, and other challenges (population growth and insecurity) threaten traditional patterns of migration. Overgrazing and damage to un-harvested farm fields have caused problems to the land as well as tension between pastoralists and farmers.

PRAPS has helped affected communities to establish rules and infrastructure for managing pastoral areas. This includes essential infrastructure around water points, reception zones for pastoral herders, pasture for the livestock, vaccination stations, livestock markets, fodder storage, and shops for livestock products. PRAPS helped to establish and improve the management of 5 million hectares of pastureland, 181 water points and 66 cattle markets, and supported the delineation of 1,400 km of transhumance corridors. In the words of one of the project implementers: "This project has helped increase the resilience of pastoral families by enabling them to express their needs, providing them with essential services and infrastructure, and giving them the tools and knowledge they need to manage this grazing land themselves on a sustainable basis."

Funders and partners

The World Bank was the primary external funder, and implementation support was provided by the Permanent Inter-State Committee for Drought Control in the Sahel (CILSS).[15]

Funding

Activities under PRAPS, in addition to contributions from participating countries, were supported by $248 million from the World Bank.[16]

[15] World Bank, 2020, **Improving Productivity for Pastoralists Across the Sahel**

[16] ibid

Supporting regional and continental agricultural research and extension agencies in Africa

Across African sub-regions

Initiatives and outcomes

Agricultural research and extension are key factors in maintaining and raising agricultural productivity. Most agricultural research and extension is carried out by national programs. However, Africa also has regional and continental agencies focused on agricultural research and extension. The West and Central African Council for Agricultural Research and Development (CORAF), the Association for Strengthening Agricultural Research in Eastern and Central Africa (ASARECA), and the Centre for Coordination of Agricultural Research and Development for Southern Africa (CCARDESA) operate at the regional level, while the Forum for Agricultural Research in Africa (FARA) and the African Forum for Agricultural Advisory Services (AFAAS) operate at the continental level.

These agencies facilitate coordination and collaboration between national programs on issues that cross national borders. They make it possible for country programs to set regional and continental priorities and, where available, to agree on which national programs should receive funding and mandates to carry out tasks of regional or continental priority. They also provide capacity building for national programs, and lead on strategic initiatives at the aggregate level (for example, the AUC's Soil Initiative for Africa, and the development of the AUC's African Climate Smart Agriculture Framework).

A significant portion of support for these agencies has come in the form of pooled support (in this case, World Bank-managed multi-donor trust funds) from external partners. This form of financing offers several best-practice characteristics: funds have been pooled, allowing for the use of a single set of governance procedures; and the funds have provided core funding to support the budgets and plans of the African agencies. This form of external support has allowed development partners to work more effectively (more efficiently through eliminating duplication of effort) and with more relevance and depth of pooled expertise to focus on issues such as climate change. This core support for regional and continental agencies in Africa has, in turn, provided the opportunity for the African agencies flexibly to identify and support their own priorities (including research and extension related to climate change).

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Funders and partners

Financing for multi-donor trust funds was sourced, among others, from GTZ, DfID, CIDA, SIDA, French Development AID, USAID, the EC, and SDC. The World Bank managed the trust funds on behalf of these contributing development partners. FAO and other technical agencies such as the CGIAR provided technical assistance from time to time.[17]

Funding

Taken together, the trust funds to FARA, ASARECA, CORAF, CCARDESA, and AFAAS totalled over $180 million over roughly eight years' time.

About E3G

E3G is an independent European climate change think tank with a global outlook. We work on the frontier of the climate landscape, tackling the barriers and advancing the solutions to a safe climate. Our goal is to translate climate politics, economics and policies into action.

E3G builds broad-based coalitions to deliver a safe climate, working closely with like-minded partners in government, politics, civil society, science, the media, public interest foundations and elsewhere to leverage change.

More information is available at **www.e3g.org**

[17] CGIAR, 2014, **Evidence of impact: Climate-smart agriculture in Africa**