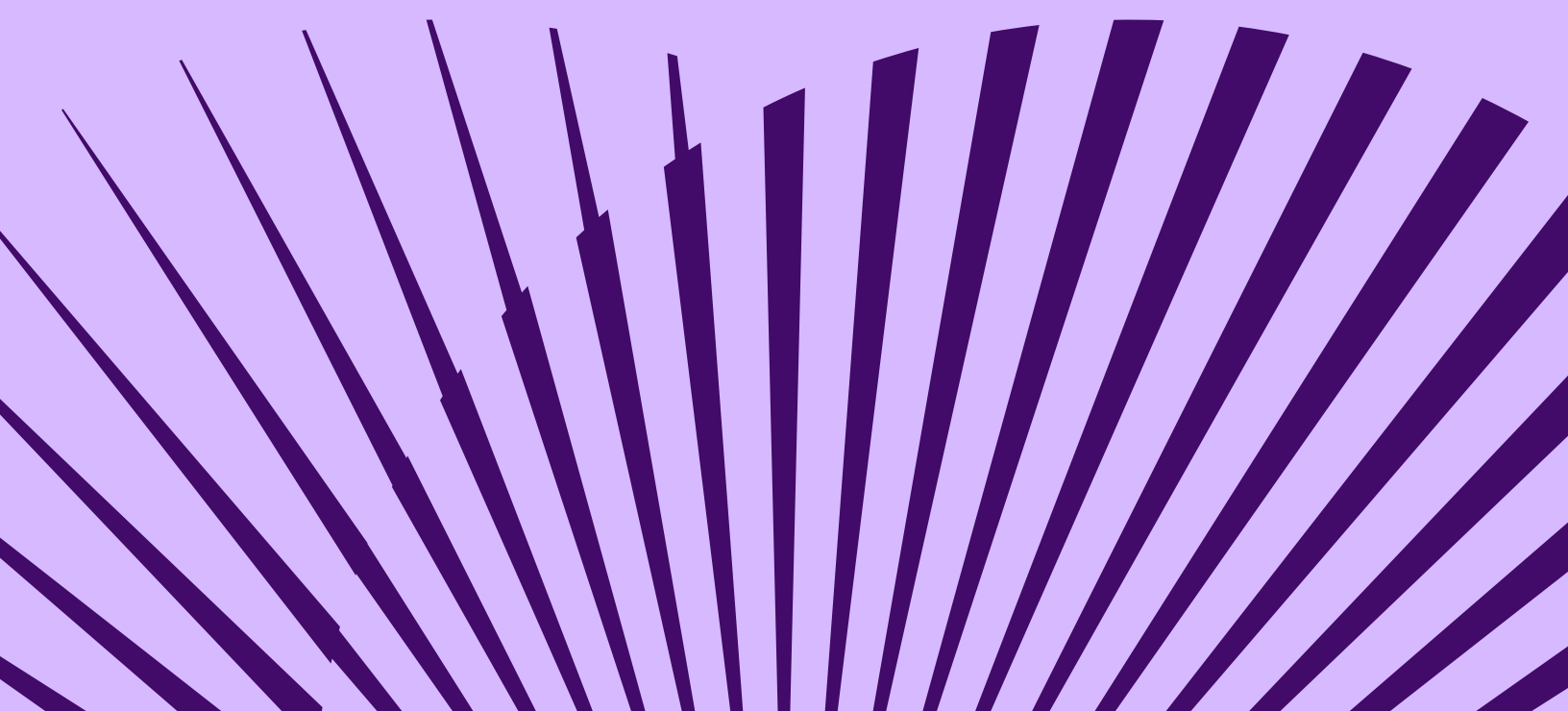


U.S. Chamber of Commerce
International Affairs
Africa

**U.S.-Africa
Business Center**

Enabling Ecosystems:

Fostering environments that support agriculture
development for smallholder farmers in Africa



Acknowledgements

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Table of Contents

Executive Summary	6
I. Background	10
II. Key Issues:	12
III. Summary	38
Endnotes.....	41





AFRICAN DEVELOPMENT BANK GROUP
GROUPE DE LA BANQUE AFRICAINE
DE DEVELOPPEMENT

Foreword by the President of the African Development Bank

Dear Stakeholders:

First, please allow me to convey a note of congratulations to the U.S. Chamber of Commerce on the publishing of the insightful and thoughtful white paper on ‘Enabling Ecosystem: Fostering environments that support agriculture development for smallholder farmers in Africa.’ I would also like to express my profound appreciation to the U.S.–Africa Business Center team and its members, particularly John Deere and other companies on the agriculture sustainability task force, for bringing this timely paper to fruition. The considered views of the American private sector presented in the paper demonstrate the necessity of both strategic and creative collaboration among various stakeholders to bolster agricultural production in Africa.

The paper is well-aligned with the African Development Bank’s Feed Africa strategy and directly addresses the priorities expressed by African Heads of State during the Africa Food Summit–Unleashing Africa’s Food Potential held in Senegal in January 2023, also known as the Dakar 2 Summit. At the Summit, African Heads of State called for greater focus in key areas, such as: blended finance, digital platforms and emerging AI technologies, mechanized solutions, streamlined policy, and investment into supply chains, corridors, and African Continental Free Trade Area (AfCFTA) infrastructure.

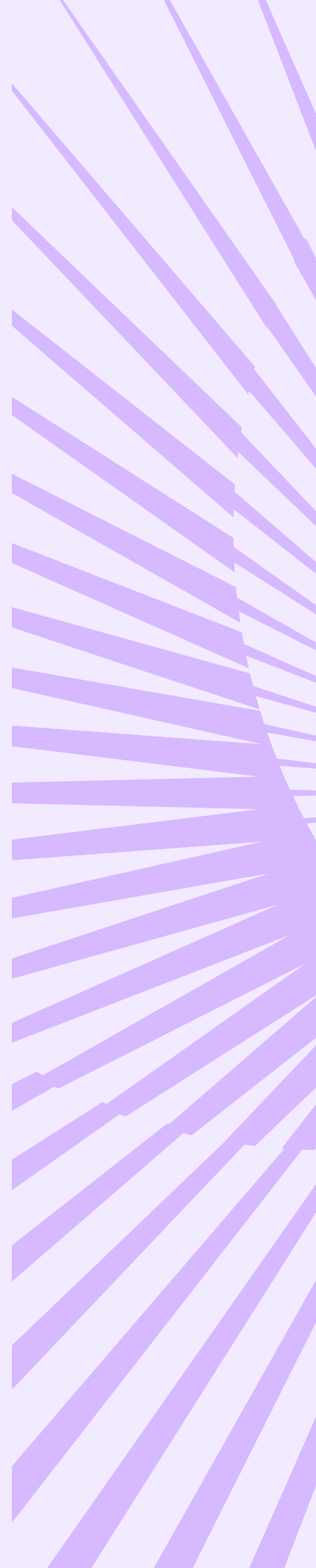
In support of the priorities laid out during Dakar 2, the African Development Bank has amplified efforts to attract and channel de-risking capital, blending it with the Bank’s resources to significantly augment lending in support of small and medium-sized enterprises within Africa’s agri-food ecosystem, to catalyze additional private sector agriculture-related investments. Furthermore, to ensure accountability to deliver results, African Heads of States and their teams have developed “Food and Agriculture Delivery Compacts.” African leadership will ensure African ownership through the Compacts.

The time is right for a global coalition of efforts around Africa to unlock its immense agricultural potential to become a global destination for meeting rising food supply shortages in the world. Concerted efforts, delivering measurable results is essential and we at the Bank stand ready and willing to partner with the U.S. Chamber of Commerce's U.S.-Africa Business Center and its members to assist countries across the continent to realize their agricultural ambitions.

Sincerely,

A handwritten signature in black ink, appearing to read 'Akinwumi A. Adesina', with a stylized flourish at the end.

Akinwumi A. Adesina
President
African Development Bank



Executive Summary

There is considerable cause for optimism about the future of farming and agricultural production in Africa. However, recent challenges—including global conflicts and climate pressures—threaten the reliance on food imports traditionally favored by many African nations.

Sustainable agriculture development can help bolster global food security efforts while also yielding additional benefits to employment, national security, and intra-Africa agricultural trade. By unpacking the major challenges and solutions to increasing food production, this paper aims to examine the potential of smallholder farming in Africa as major food producers for the continent, specifically in Sub-Saharan Africa (SSA), where needs are most acute.

Inputs to this paper have been provided by the U.S. private sector, which has a vested interest in the success of African agriculture and years of expertise in the products, solutions, and policies that will help achieve success for the wider agriculture ecosystem. The intention of this paper is to advance policy recommendations for consideration by U.S. and African governments that will create more opportunities for investments and partnerships with the private sector and multinational organizations.

The recommendations proposed are listed below.

Issue 1: Financing sustainable agriculture

- Using blended financing efficiently and covering all stages of a program from conception to upkeep.
- Adding micro-finance options and strengthening Micro-Finance Institutions (MFIs) to allow for the purchasing of equipment, fertilizers, knowledge transfers and skills training, and increasing service providers for various initiatives.
- Offering credit guarantee schemes for increased access to loans at lower interest rates for smallholder farmers and Agri-SMEs.
- Increasing collateral for loans by formalizing landownership and registration procedures.

- Investing in increased capacity building and financial literacy for farmers and producers.
- Increasing flexibility in U.S. government-led lending regulations, particularly in lending to state-owned enterprises.
- Aligning standards and processes, including using existing common frameworks and AU initiatives as guideposts where possible.
- Investing in and strengthening agricultural research centers that can help apply best practices and coordinate policies between governments.

Issue 2: Access to proper inputs, fuel, and fertilizers

- Greater discipline in implementing global best practices for farming.
- Prioritizing investments and implementation strategies for access to higher quality inputs.
- Training on inspection sampling and testing of imported seeds, crops, and food, aligned around SPS and Gafta standards.
- Training on best practices for the management and application of pesticides and microbiological control.
- Employing climate and pest-resistant plant technologies, including genetically modified seeds.
- Aligning standards around climate solutions, including promotion of climate smart agriculture techniques.
- Encouraging government and business site visits to farming communities and trade missions between the U.S. and Africa for increased bilateral knowledge-sharing and best practices for climate smart agriculture.

Issue 3: Access to mechanized solutions, including training, parts, and service

- Designing holistic and sustainable mechanization strategies through public-private partnerships.
- Partnering on the implementation of local mechanization training centers or other platforms that allow for proper education and training for mechanized equipment.
- Zero-rating any duty or tax on the import of agriculture machinery parts and providing trade facilitation measures.
- Encouraging drip-irrigation systems in communities.
- Funding and educating on water purification and reuse facilities.

Issue 4: Access to enabling technologies and technology infrastructure, including incorporating SMEs and mid-cap companies to bridge the gaps

- Funding the development of and training for technology-driven initiatives.
- Partnering with agricultural small and medium enterprises (Agri-SMEs).
- Partnering with business associations such as American Chambers of Commerce (AmChams) and other local and national business organizations.
- Implementing electrified or off-grid cold storage solutions.
- Carefully considering cross-border data regulations and emerging AI technologies.
- Financing for electricity infrastructure projects.

Issue 5: Access to off-takers, trade infrastructure, supply chains, and commodity markets

- Building and maintaining inexpensive transportation systems including natural water routes, canals, railroads, roads, and highway systems.
- Matching with guaranteed or consistent off takers.
- Setting consistent quality and safety standards for agriculture products and traded goods.
- Implementing unitization and setting standards for truck sizes, racks, and other logistics equipment.
- Diversifying export markets to create more market potential and stabilize export revenues.
- Partnering with the AfCFTA to suggest policy frameworks and support infrastructure development.

Despite concerns over Africa's food security, significant opportunity exists to improve small-scale farming for large-scale impact. Each of the systemic issues identified within smallholder farming practices can be solved for, allowing deepened, sustained engagement for African governments, the U.S. government, Multilateral Development Banks, NGOs, and the private sector. We hope that these recommendations serve as the basis for increased attention to smallholder farming in Africa and allow for a more sustainable future that will significantly increase livelihoods on the African continent and beyond.

I. Background

There is reason for optimism about the future of farming in Africa. Agricultural productivity increased by 13% on average every year between 2015 and 2020 and the trade deficit for agriculture fell 26% in this period as the continent increased its global market share in agricultural commodities¹. Challenges exist: The COVID-19 pandemic caused systemic disruptions in supply chains and exacerbated economic hardships amongst Africa's poorest communities. The increased intensity and frequency of climate disasters has had a catastrophic impact on arable farmland, with the potential to reduce the mean yield of 13% in West and Central Africa, 11% in North Africa, and 8% in East and Southern Africa². Heavy reliance on grain and fertilizer imports from Ukraine and Russia has led to a surge in prices averaging 23.9% in 2020-22, the highest increase since the 2008 financial crisis³.

Currently, one third of all calories consumed in Africa are imported, with food imports valued at an estimated \$35 billion annually. If this trend continues in line with population growth, it is estimated to reach \$110 billion by 2050⁴. The challenges of increasing food prices are felt most acutely in Sub-Saharan Africa (SSA), where additional harm from domestic conflict in multiple countries has interrupted the movement of food aid and trade. The growing pressures emerging from the continued high rates of food imports indicate that the current model of food supply for the continent is not working. Solutions for increasing capacity and productivity on farms within Africa are needed to provide tenable solutions for feeding the growing population.

Numerous parties play an important role in increasing Africa's agricultural capacity, but none more so than national governments. Creating a policy environment encouraging growth and accountability, as well as rural and agricultural infrastructure development, will be critical. The private sector is extremely important in providing technical solutions, creating jobs and economic opportunities, and in implementing both government and civilian led initiatives to increase Africa's agricultural yield. The U.S. government plays a key role in offering policy support and financial aid to African governments and the private sector alike in addressing shared food security and climate objectives.

Additional actors include multinational organizations such as the African Union (AU), the African Development Bank (AfDB), the Alliance for Green Revolution in Africa (AGRA), the World Bank, and the International Monetary Fund (IMF), which all heavily support the coordination and financing of agricultural development in Africa. The AU's recent admittance to the G20 provides opportunity for heightened access to international solutions and a policy sharing role, rather than merely receiving outcomes of decisions. The need to increase support systems for smallholder farmers and other large population segments will likely become more evident as the AU's role solidifies.



II. Key Issues:

Issue 1: Financing sustainable agriculture

Addressing high risk and low rates of investment, and developing access to innovative financing solutions, is crucial. This is especially important as global interest rates rise, increasing the cost of finance and inputs. On the farming side, low yields continue to be among the most pervasive issues threatening profitability and competitiveness. The level of value addition and crop processing of agricultural commodities is low and post-harvest losses in Sub-Saharan Africa average 30% of total production, to the amount of over \$4 billion each year⁵. Key issues in financing include a lack of security, risk-based pricing increasing the rate of lending to an unobtainable level for most farmers, and a lack of technical expertise for production as well as financial planning and management.

Solutions

Using blended financing efficiently and covering all stages of a program from conception to upkeep

Blended financing is a powerful tool that must be used efficiently to be effective—this includes covering all stages of a program from conception to upkeep to offer maximum benefits for smallholder farms. This means financing all component parts of a project, including preparation facilities, feasibility studies, cost-to-serve capacity and infrastructure needs, hiring technical assistance and consultants, as well as training local communities and embedding maintenance and upkeep costs within financial commitments. U.S. initiatives such as the American Catalyst Facility for Development (ACFD) are good opportunities for more strategic coordination within the U.S. government, but increased clarity around implementation and project solutions are needed for the private sector and outside organizations to partner effectively⁶. Maintaining a balanced equity contribution (ideally around +/- 40% own contribution) is an additional key factor in successful blended financing projects that should be prioritized.

Absa Group: Agricultural guarantees for micro, small, and medium-sized SMEs

Absa Group has a longstanding relationship with U.S. government programs such as the U.S. International Development Finance Corporation (“DFC”), sharing a common goal of providing access to financing to small and medium-sized enterprises. Absa has put in place \$100 million of risk-sharing loan portfolio guarantees together across five African markets (South Africa, Botswana, Mozambique, Zambia, and Ghana) to enable Absa to lend to a traditionally riskier business segment with critical needs for financing. Some of these businesses will also receive support from existing U.S. Agency for International Development (USAID) technical assistance programs, strengthening the businesses’ ability to thrive and grow. The programs also drive inclusivity, helping youth and women business owners achieve their ambitions of greater market participation.

The three most recent guarantees signed (Mozambique, Zambia, and Ghana) are specifically in support of the agricultural sector, a driving force of the local economies. For example, in Mozambique, agriculture contributes about one quarter of its GDP and employs 80% of the national workforce. Despite its significance, agricultural productivity and growth has remained relatively weak, with most production concentrated in subsistence farming, leaving productivity below regional averages. The historic lack of access to financial capital for SMEs has excluded them from the ability to invest in productivity and quality-enhancing technologies and practices. Under Absa’s program in Mozambique, it is expected that 75-100 loans will be disbursed, with 70% of total lending directed to the agriculture value chain and at least 15% of total lending to women-owned businesses, with an average loan size per borrower of \$220,000.



Adding micro-finance options and strengthening Micro-Finance Institutions (MFIs)

Micro-finance options need to be added and Micro-Finance Institutions (MFIs) built up to allow for the purchasing of equipment, fertilizers, knowledge transfers and skills training, and increasing service providers for various initiatives (See issue 2). Studies have shown that building up microfinance significantly increases women's access to loans and can markedly reduce poverty levels⁷. Unfortunately, these tend to be poorly supported and prove financially unsustainable in the long run. Increased support for MFIs from international organizations and the U.S. government, as well as national government subsidies and tax breaks would help support the longevity of these loan programs.

Offering credit guarantee schemes for increased access to loans at lower interest rates for smallholder farmers and Agri-SMEs

Credit guarantee schemes, including portfolio credit guarantee, portable credit guarantee, and trade credit guarantee, are useful tools for mitigating risk of working capital, securing investment capital to guarantee parts of potential loans, allowing for more competitive interest rates. It also can allow for credit risk-sharing that allows for increased access by smallholder farmers and SMEs that otherwise would not have access to such loans⁸.

Increasing collateral for loans by formalizing landownership and registration procedures

In addition to credit guarantee schemes, key to helping farmers obtain loans is increasing collateral by formalizing landownership and registration procedures. Currently, national governments across Sub-Saharan Africa have varying degrees of formalization and support for these procedures, with an estimated 78% of arable land across the continent remaining without title⁹. Advocacy and assistance in building processes for land titling on the part of the U.S. government and other international institutions can greatly assist with increasing protection for farmers and increasing investor confidence. It also serves to reduce corruption gifts or bribes of undocumented land and provides a basic framework for property taxation, amongst other auxiliary benefits¹⁰.

Investing in increased capacity building and financial literacy for farmers and producers

It is difficult for farmers to secure the loans needed even when they are otherwise available if a basic understanding of credit records and other loan principles are missing. Mentoring and training is an important aspect of many private sector initiatives and should be increasingly prioritized as loans are made available through private and public methods.

Increasing flexibility in U.S. government-led lending regulations, particularly in lending to state-owned enterprises

Currently, the largest credit-worthy customer in most African countries is the national government, and it needs to be a counterparty to many contracts implemented in-country¹¹. However, U.S. investment facilities such as the International Development Finance Corporation (DFC) are not authorized to finance projects run by state-owned entities or governments, severely restricting partnerships on initiatives that would have a growth-multiplying impact. Increased flexibility in U.S. government-led lending regulations, particularly in lending to state-owned enterprises, would allow for increased private sector investment on the continent.



Aligning standards and processes, including using existing common frameworks and AU initiatives as guideposts where possible

Greater alignment on standards and processes for funders and development agencies is needed to enable effective scaling-up of projects and greater consistency across projects. This includes using existing common frameworks and African Union (AU) initiatives and frameworks such as the AU's Country Food and Agriculture Delivery Compacts (CAADP) across Africa. This allows for consistency and structure around which many various partners can combine efforts on different parts of a project or implementation of an initiative (ex. delivery of fertilizers) to catalyze momentum for change.

Investing in and strengthening agricultural research centers that can help apply best practices and coordinate policies between governments

Agricultural research centers, such as the Forum for Agricultural Research in Africa (FARA), national agriculture research centers, and organizations such as the African Plant Breeders Association, can help coordinate cooperation between countries and strategic institutions for agricultural research, development, and innovation that are needed to implement solutions¹². These and other organizations focusing on applying new methods for increasing yield and nutritional value of crops, scientific research and development, as well as coordinating policies and best practices, will be needed for long-term and consistent agricultural development¹³. It will also help with application of research, which is a key area of development needed. They additionally serve the advisory role of helping individual countries develop action plans, as well as specific policy and project guidance for agriculture. These research centers should see increased investment and support to help implement coordinated recommendations and agricultural solutions across the continent.

Country Food and Agriculture Delivery Compacts (CAADP)

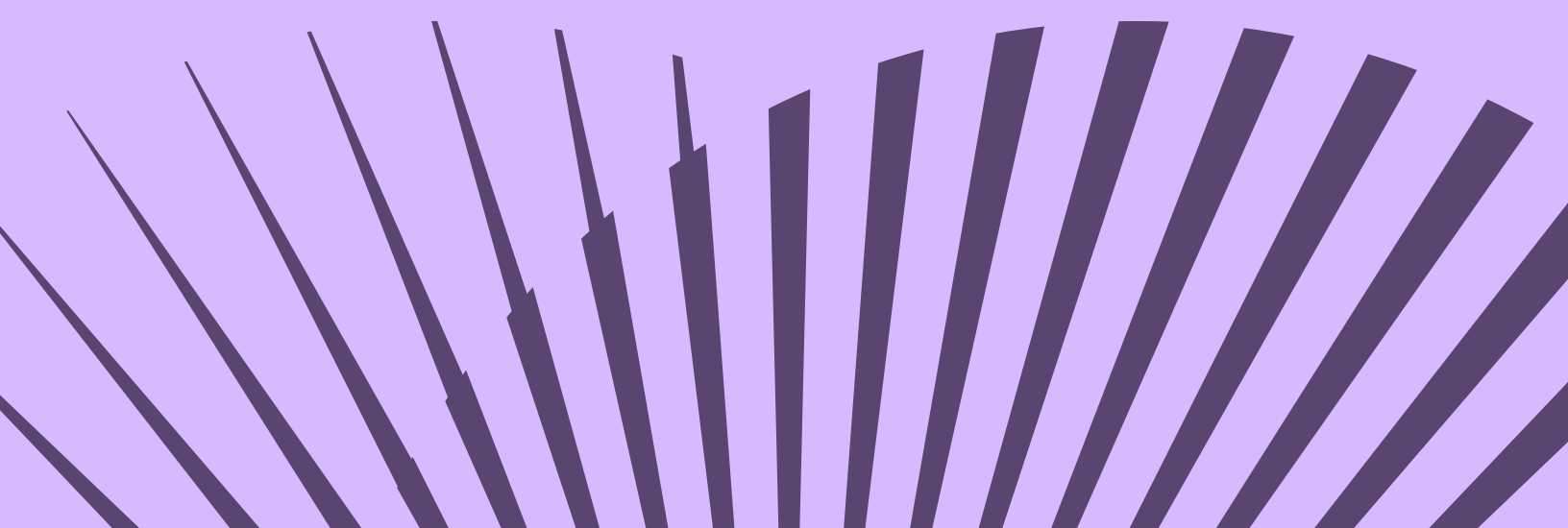
National governments across Africa allocate at least 10% of national budgets to agriculture and rural development, with targets of a minimum of 6% growth rates annually in line with African Union Agenda 2063 goals. Building off these national frameworks for investment can amplify financing already allocated to the continent through U.S. government programs and agencies such as the International Development Finance Corporation (DFC) and Partnership for Global Infrastructure and Investment (PGII), private sector-led initiatives, and multilateral development bank (MDB) grants.

At the 2022 U.S.-Africa Leaders Summit in Washington, D.C., the U.S. government committed to investing \$2.5 billion in emergency aid and medium-to long-term food security assistance for resilient African food systems and supply markets and launched a new strategic partnership with the

African Union. The U.S. government also announced partnerships with the African Development Bank in support of food and agriculture projects in the short, medium, and long terms.

At the AfDB's Dakar 2 Summit on Food Sovereignty and Resilience in early 2023, African leaders—supported by the U.S. government and MDBs—further emphasized the need for direct financial investment in support of CAADPs. These compacts play a direct role in implementing food security goals in African nations and concretely outline production targets for key agricultural staples and a road map to reach those targets, principally by raising productivity, building critical market infrastructure, and enacting enabling policy reforms.

Aligning commitments around CAADPs or similar frameworks allows for greater harmonization of financing to allow for even greater impact.



Issue 2: Access to proper inputs, fuel, and fertilizers

Despite having 25% of the world's arable land, SSA produces only 10% of the world's agricultural output¹⁴. A poor supply of inputs, particularly seeds and fertilizers, lead to pest infestation and disease, and low crop variety continues to threaten marginal communities disproportionately. Average maize yield in SSA is at only 50% of average yield in all developing countries throughout the globe and is at a mere 20% of the average yield for developed countries, indicating a need for short, medium, and long-term solutions for increasing yield¹⁵.

Solutions

Greater discipline in implementing global best practices for farming

High-yield crop technologies such as hybrid corn, cassava seeds, and higher-nutrient fertilizers that have been commonplace in other regions for decades are one-third as likely to be used in SSA¹⁶. Irrigation systems similarly are rarely implemented and an estimated 95% of agriculture relies on rain for water¹⁷. Encouraging the use of these modern technologies will be important for setting a higher standard for crop yields. Governments should incentivize the use of these resources and work with the private sector to standardize a higher quality of inputs to which farmers have access.

Prioritizing investments and implementation strategies for access to higher quality inputs

While higher quality inputs than those commonplace in many regions are not necessarily more expensive or difficult to obtain than current inputs used, initial capital and an implementation strategy are needed to ensure that farmers have access to this crop technologies and farming infrastructure. At the U.S.-Africa Leaders Summit in 2022, the U.S. government committed to increasing access to inputs for fertilizers, but there is little clarity on how that access will be achieved. Committing higher dollar amounts to inputs with a coordinated strategy for implementing solutions is needed.

Bayer: Advancing crop technology with the TELA Maize Project

The Water Efficient Maize for Africa (WEMA) Program was created in 2008 to address the threat of climate change by developing and deploying new drought-tolerant and insect-resistant (climate-resilient) maize varieties for smallholder farmers through innovative public-private partnership.

The African Agricultural Technology Foundation, a non-profit technology transfer organization, leads the partnership that includes Bayer Crop Science (Bayer), the International Maize and Wheat Improvement Center (CIMMYT), and the National Agricultural Research Systems of Ethiopia, Kenya, Mozambique, Nigeria, South Africa, Tanzania, and Uganda.

Through TELA[®], more than 120 conventional white maize hybrids have been registered for release with 40+ African seed companies in 13 African countries licensed to produce and sell DroughtTEGO[®] conventional hybrids royalty-free to smallholder farmers. Through an account management system implemented by the program,

the volumes of certified seeds that were produced by licensed SME seed companies were tracked annually. It was estimated that between 2013 and 2020, over one million hectares were sown with over 29,000 tons of certified seeds of these resilient maize varieties in 13 countries.

Impact in Nigeria: At the current cost of insecticides alone excluding spraying costs, Nigeria spends 268 billion Naira (over \$600 million) annually importing chemicals to protect maize against the fall armyworm-ravaged fields. A significant amount of this cost will be spare with the use of TELA maize varieties when approved for commercialization. It has been estimated that if just 10% of Nigerian farmers adopt TELA maize, it will give additional cost-benefit of 58 billion Naira (more than \$140 million) annually to the country because of the yield advantage of 19% recorded from the confined field trials.



Training on inspection sampling and testing of imported seeds, crops, and food, aligned around SPS and Gafta standards

Even basic training on inspection sampling and testing of imports can help prevent the entry of foreign pests and diseases. National and regional alignment around global standards—such as under the World Trade Organization (WTO) Sanitary and Phytosanitary Measures (the SPS Agreement¹⁸) and through the Grain and Free Trade Association (Gafta) promotes widely recognized frameworks that can identify affected crops and proven solutions in a manner consistent with international best practices. Government implementation and regulation of these standards is discussed in issue 5.

Training on best practices for the management and application of pesticides and microbiological control

Similarly to training on best practices for inspection sampling and global standards, training on the management and application of pesticides (i.e. fungicides and insecticides) and microbiological control (targeted SPS and maximum residue levels issues to align with global standards) should be offered to farmers, inspectors, and exporters across the supply chain to ensure consistency and international best practices.

Employing climate and pest-resistant plant technologies, including genetically modified seeds

Genetically modified seeds are a viable option for increasing yield, but more importantly decreased crop loss and increased nutritional content¹⁹. Recent technologies have allowed for more diverse seed options, heartier varieties, and increased resilience to extreme weather (wind, heavy rains, and flooding) as well as pests and disease. It can also reduce reliance on insecticides that can be damaging to the environment, resulting in a decreased environmental impact estimated at 18.5%²⁰. While there has been pushback in some African countries, many are updating policies to allow for the importation and utilization of these solutions. The U.S. and other partners should encourage hybrid plant technologies where applicable as a solution to countering the impacts of climate change, and African governments should investigate how these solutions could play a role in their food security strategy.

Aligning standards around climate solutions, including promotion of climate smart agriculture techniques

Given the increasingly severe impacts of climate change in Africa, emphasizing the importance of sustainable agriculture practices that can reduce climate impact will be critical. As with alignment around

financing projects, aligning standards around climate solutions will also be important for both broadening and deepening impact. Climate Smart Agriculture (CSA) is a strong candidate for this alignment. This system centers around three main outcomes: 1) Enhancement of agricultural production (“Productivity”), 2) Enhanced resilience (“Adaptation”), and 3) reduced emissions (“Mitigation”)²¹. Many multilateral institutions are already heavily promoting CSA in projects, and the World Bank has been working to develop CSA Investment Plans (CSAIPs) for Zimbabwe, Zambia, Lesotho, Mali, Burkina Faso, Ghana, Cote d’Ivoire, Morocco, and the Republic of Congo²². CSA encourages coordination across agriculture subsectors—crops, livestock, forestry, water, energy, and infrastructure—to optimize productivity and reduce tradeoffs.

Encouraging government and business site visits to farming communities and trade missions between the U.S. and Africa for increased bilateral knowledge-sharing and best practices for climate smart agriculture

Bilateral knowledge transfers are important tools for implementing solutions and education. In addition to the ‘field days’ recommended by the PAC-DBIA, reverse trade missions to the U.S. for African policymakers and regional leaders, as well as youth through fellowships and trainings, would help ensure exports of U.S. technologies, products, and service when implementing CSA practices, and help teach best practices to African farmers based on global standards.

Climate Smart Agriculture and Fertilization

One example of CSA through conservation agriculture is in fertilization. The maintenance of a permanent or semi-permanent organic soil cover, which could be live crop or dead mulch, uses existing materials to better protect the soil from sun, rain and wind, and feed soil biota, while mitigating the impacts of potentially damaging practices such as intensive tillage in addition to improving soil quality for better crop yield. CSA takes more deliberate advantage of natural processes; setting the base for better sustainable agricultural production intensification than conventional agriculture. This is especially the case when complimented by other known good practices such as the use of quality seeds, and integrated pest, nutrient, weed, and water management.



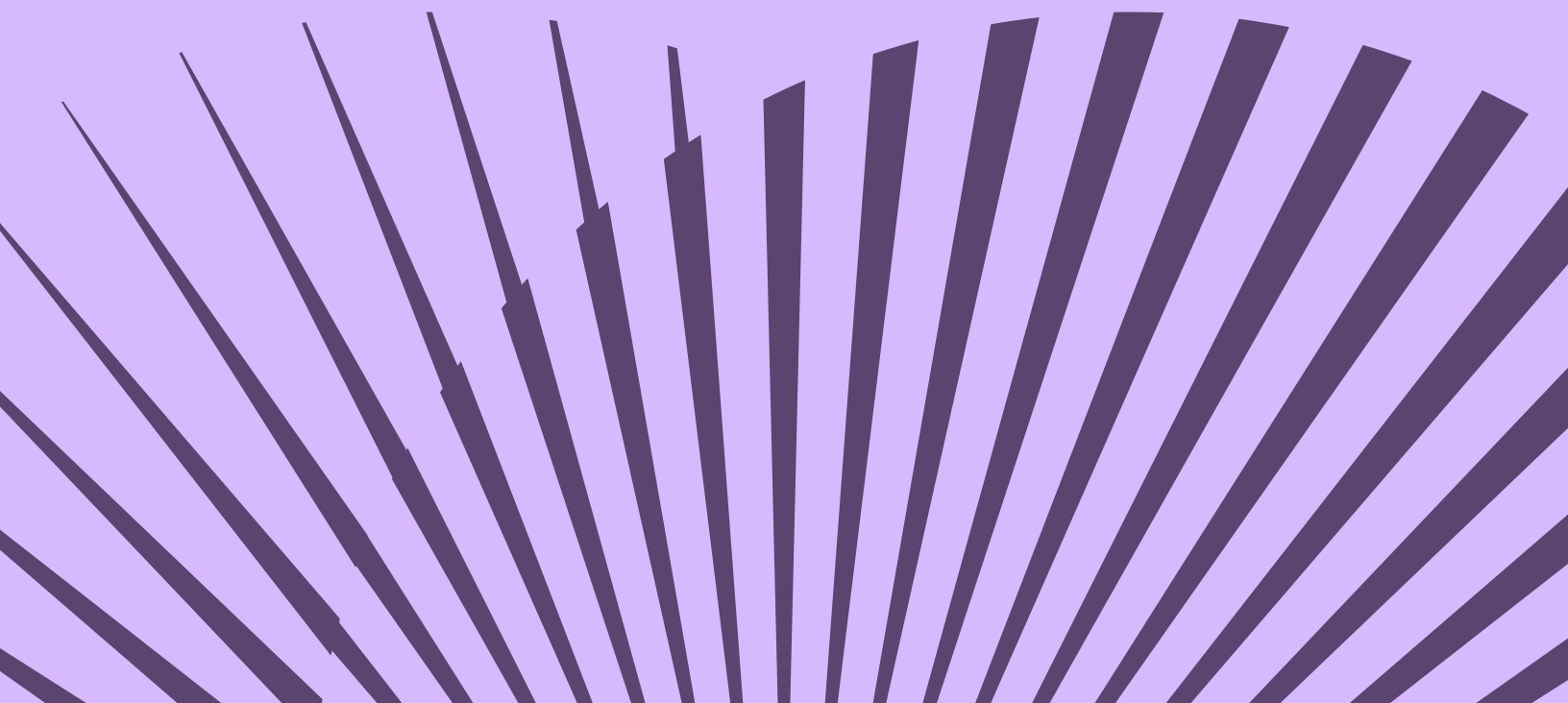


PAC-DBIA Recommendations for Climate Smart Agriculture and CSA “Field Days”

Included in the April 2023 Presidents Advisory Council on Doing Business in Africa (PAC-DBIA) report were recommendations around the promotion of climate-smart agriculture solutions, calling for the U.S. interagency to support U.S. and African companies in showcasing and introducing their products to market to get them into the hands of more farmers. This recommendation leans on the U.S. Department of Agriculture’s AIM for Climate and USAID’s Feed the Future initiatives. Because of how Africa’s agriculture sector is on the front lines of encroaching climate change impacts, farmers and communities in this sector are the key audience for such climate-smart solutions so

that they can remain adaptable and productive to support food security.

Another recommendation of the PAC-DBIA report were trade mission ‘field days’ across different sub-regions of the continent representing different climates and crop systems. This would help provide context for U.S. and African government officials travelling within the region to understand issues more deeply. They also offer local farming communities the opportunity to learn about such climate-smart solutions. These ‘field days’ touch on both policy and practical lessons to showcase CSA equipment, inputs, technology, and market tools.



Issue 3: Access to mechanized solutions, including training, parts, and service

Farmers with tractors consistently get their crops in the ground before the end of the planting season, plant more hectares of crops, and have more time to assist other farmers with planting. In SSA, farmers have one-fifth the number of tractors per 1,000 hectares (ha) of cropland as is seen in South Asia and Latin America²³. Poor access to finance for the purchase and upkeep of mechanized equipment is the most important factor limiting mechanization. Mechanized tools, though able to drastically increase productivity and crop yield, are expensive both upfront and to maintain, and the volatility of farm-gate prices means the investment is often not considered worthwhile for farmers and lending institutions alike²⁴. Additionally, water access is limited to rainfall in many regions, which is either unevenly distributed or scarcely available, and a lack of water reuse facilities and recycling mechanisms leads to considerable waste when resources are available.

Solutions

Designing holistic and sustainable mechanization strategies through public-private partnerships

Mechanization uptake can rapidly increase a farmer's productivity, allowing for the more efficient use of inputs like seeds, fertilizer, and crop protection. It enables farmers to make more efficient use of their time and labor, increasing on-farm income that can be reinvested back into the family and the agribusiness. It is also shown to increase support for off-farm activities, nutrition diversification, and children's school fees²⁵. Micro-finance loans would greatly help with mechanization uptake (See issue 1), as would government support for lower interest rates on equipment purchases, but designing holistic and sustainable mechanization strategies through public-private partnerships are another important tool for financing. Sustainable strategies for regional mechanization that consider farmer specific needs such as payment plans for the purchase of their equipment during the harvest or establishing local knowledge exchange platforms can greatly help farmers meet mechanization targets while overcoming regional-specific challenges²⁶. Companies can work with farmers and governments, with support from NGOs and MDBs as applicable, to determine these models in various smallholder farming communities.

John Deere: The SMART approach

John Deere's SMART approach encompasses nearly 190 years of expertise in supporting emerging farmers access mechanized solutions, focusing on "Solutions" for smallholders' unique needs, "Mechanization" for higher yield, "Access" to reliable financing tools, "Reliability" for lower costs and timely repair, and "Technology" and training for agribusiness success. This approach guides John Deere's efforts for customers across Africa, though one notable project in South Africa's Eastern Cape is demonstrating the value of these solutions. In September 2021, Deere launched a pilot project with smallholder farmers, working in consultation with communities around OR Tambo International Airport in Johannesburg and the Mthatha district to identify farmers who needed the right solutions to grow their operations. In gaining access

to mechanization, the farmers were able to get their crop in and out of the ground in less time, planted a greater area, and doubled their maize harvest. These gains even allowed the farmers to develop contractor businesses, whereby local farmers with tractors, combines, and implements contract this farming equipment out to their neighbors, thereby assisting other small-scale farmers with access to affordable mechanization. This allows them to improve agricultural yields whilst earning a living and employing others. Deere continues to expand this project in partnership with local and provincial governments to take more farmers to the next level, grow their profitability, and create a more food-secure province. This is an example of what good collaboration between the private sector, NGOs, government, and engaged farmers can achieve.



Partnering on the implementation of local mechanization training centers or other platforms that allow for proper education and training for mechanized equipment

Introducing tractors, tools, and other farming equipment to a community requires proper education and training for such tools to be effective. Mechanization training centers or similar educational resources are important resources for communities. Currently, in addition to the ongoing service and maintenance of the tractor, a dealer of mechanized equipment often runs training programs and demonstrations to help farmers learn how to operate and maintain equipment. While such mechanization centers and processes can be and are largely privately run, local and national governments should partner in these mechanization centers to ensure their long-term impact. Such support could be identifying locations where the needs are highest for the local farming communities, suggesting crop systems that align with the trade and food security goals of the country, and financial support for the farmers' access to the equipment in the forms of subsidies and guarantees.

Zero-rating any duty or tax on the import of agriculture machinery parts and providing trade facilitation measures

A recommendation for national governments is to zero-rate any duty or tax on the import of agriculture machinery parts. This ensures that parts remain cost-effective for farmers. Timely access to parts and service is a critical factor for effective mechanization, as a tractor left unusable due to delays in servicing negates the trend in mechanization. It is rendered useless for the time-sensitive tasks that the farmer is facing. While the original equipment manufacturer has a network of customer-facing outlets through its dealer partners, who are responsible for the primary relationship with the customers for the upkeep of their purchased equipment, they cannot be helpful if they themselves face obstacles in moving parts into the country. Concurrently, trade facilitation measures must be in place to ensure timely clearance of parts imports at the border, as a steady stream of replacement parts is no use if they are sitting at a port of entry for weeks or months.

Encouraging drip-irrigation systems in communities

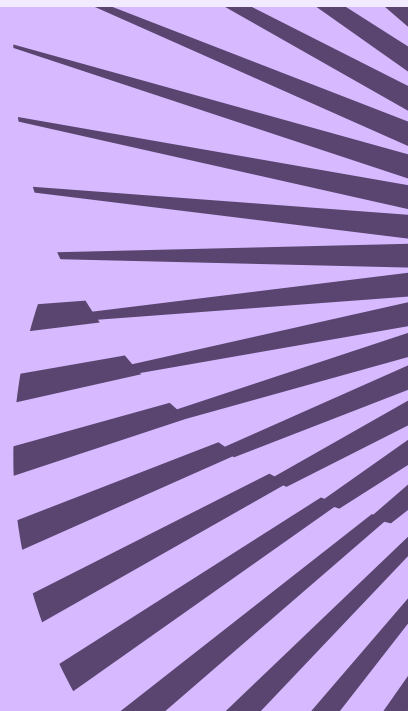
Drip-irrigation systems are a more affordable and energy-efficient solution to help overcome the presently inconsistent water access and heavy reliance on rainfall. Average yields in irrigated farms are 90% higher than those of nearby rain-fed farms²⁷. Drip-irrigation, particularly low-energy drip irrigation, uses less energy than sprinkler systems, as well as minimizing evaporation and run-off. They are also less sensitive to changes in input parameters, including groundwater depths, crop water needs, and available time for irrigation²⁸.

Funding and educating on water purification and reuse facilities

Water purification and re-use facilities can help employ existing resources more efficiently. While some cultural beliefs and mismanaged septic systems lead some to favor desalination (in coastal cities), rainwater capture, or other solutions, water reuse is proven to be much more effective for meeting clean water needs in growing populations with increasingly severe periods of drought and flood²⁹. Infrastructure technology such as wastewater capture, storage, treatment, and management, as well as the separation of sewage systems from clean water supply, are needed. Wastewater irrigation is a common practice in many regions and can pose a huge health risk, contaminating food used for consumption³⁰. While blended financing is a large component of implementing solutions (See issue 1), partnering with national and regional governments and sharing best practices on water management, including through “field days” and reverse trade missions (See issue 2), can go a long way in increasing awareness around managing water supply.

Mechanization Training Centers

In several countries across Africa, companies such as John Deere and their dealer partners run mechanization centers that help to train both tractor operators as well as contractors/agribusinesses. These trainings focus on business practices, sustainable agronomy, financial management, and tools such as phone apps that help them to grow their contracting businesses.



Issue 4: Access to enabling technologies and technology infrastructure, including incorporating SMEs and mid-cap companies to bridge the gaps

Gaps in technology are a significant limitation to productivity for many smallholder farmers. A lack of cell phones, enabling technologies, as well as poor technology infrastructure and inconsistent energy supply have inhibited growth and adaptation to changing environments and keeping pace with global markets. While high-capital digitization programs are not always necessary for change, many basic problems, such as the estimated 30-40% crop loss for Sub-Saharan Africa, can be solved by technology infrastructure such as cold storage solutions³¹.

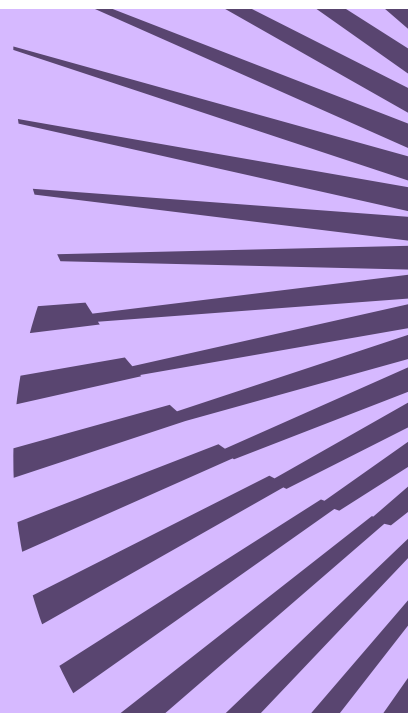
Solutions

Funding the development of and training for technology-driven initiatives

Advances in mobile phone apps and drone systems have played an increasing role in data collection, seed delivery, and determining optimal crop selection³². E-vouchers, digital payment and ordering systems, and other distribution tools can also be utilized for this purpose. Funding the development of these technology-driven initiatives (See issue 1 on micro-financing), as well as offering training on how to best utilize them can go a long way towards increasing the ease of doing business.

African Union High-Level Panel on Emerging Technologies (APET)

Initiatives such as the African Union High-Level Panel on Emerging Technologies (APET) work with farmers in Africa to determine how to digitize to increase yield and improve resilience, as well as how to improve access to skills-training business development to increase scale. Partnership with APET and other key partners in this space allow for the effective coordination and distribution of support for these digital tools at all stages of development.



Partnering with agricultural small and medium enterprises (Agri-SMEs)

Small and medium enterprises in the agricultural sector (Agri-SMEs) tend to be nimbler and better placed to bridge many of these gaps in digital farming practices. The 2019 Africa Agricultural Status Report (AASR) by the Alliance for a Green Revolution in Africa (AGRA) highlighted the role of SMEs as the “hidden middle” rather than the “missing middle,” explaining that SMEs are working to change the subsistence farming equation in Africa. Most of the food consumed is not direct from hand to mouth, but rather flows through SMEs and other private sector value chains providing a wide range of services to farmers in terms of production, processing, packaging, and distributing. Indeed, only 20% of farmers can be defined as practicing traditional subsistence farming³³. This also provides a suitable opportunity to engage more youth in farming practices, as applied agriculture centered on technological and business skills is generally considered a more attractive career path than traditional subsistence farming.

Financing for Agricultural SMEs in Africa (FASA)

At the 2023 United Nations General Assembly, the U.S. Agency for International Development announced the Financing for Agricultural SMEs in Africa (FASA) in partnership with the U.S. Congress and the government of Norway to provide initial commitments of \$35 million, with the goal of reaching \$200 million in commercial financing that can serve to reduce investment risk into these innovative agri-businesses. This model serves to showcase how partnerships across governments and the private sector can support growth at all levels of the business ecosystem by overcoming some of the greatest barriers to growth and development.



Partnering with business associations such as American Chambers of Commerce (AmChams) and other local and national business organizations

While SMEs play a critical role in high-value agricultural industries such as fruits and vegetables, where the private sector has more autonomy and thus more room to innovate, larger and more established companies also have an important role to play. Making changes in more tightly regulated industries such as grain processing requires the involvement of companies that have the capacity to apply changes more quickly and efficiently. While needs vary depending on the country, value chain, and sector, business associations such as American Chambers of Commerce (AmChams) and other local and national business organizations and cooperatives can help SMEs have more impact and match with larger companies for partnerships to implement bigger projects. They also help larger companies combine efforts and act more effectively to make changes in heavily regulated industries. De-risking many innovative ventures from start-ups and providing financial support for these larger projects are also important components of getting these companies from idea to action (See issue 1).

Implementing electrified or off-grid cold storage solutions

Electrified or off-grid cold storage solutions can significantly reduce food waste, with properly implemented solutions saving an estimated 475 million tons of food saved in Sub-Saharan Africa—a quantity equivalent to feeding 950 million people per year³⁴. Off-grid or renewably powered cold storage are often preferred due to low rates of electrification and access to renewable energies. However, as electrification becomes available, cold storage should be an early contender for energy use.

GrowAgric & Microsoft: Engagement from companies of all sizes

A finalist in the U.S.-Africa Business Center's 2022 Digital Innovation Competition, Kenyan startup GrowAgric has become an important tool for many farmers in Kenya. The GrowAgric platform offers learning courses on farming practices and a platform to help farmers access financing, in addition to providing digital tools for keeping accurate and consistent records and reaching potential buyers for products. This innovative, tech-driven start-up helps connect different pieces of the supply chain through a single, easy-to-use platform that can serve as a one-stop-shop for farmers looking to make their farming practices more efficient.

One of the limitations to SME growth is consistent access to affordable broadband connectivity, which is how digital platforms like GrowAgric can function as a resource to smallholder farmers. The private sector has an important role to play in offering reliable services.

As part of the Microsoft Airband Initiative, for example, Microsoft has committed to bringing affordable internet access to 250 million people in unserved and underserved communities around the world by the end of 2025. This will include 100 million in Africa. In Kenya, Microsoft is partnering with Mawingu Networks to bring high-speed, low-cost internet to over 5 million people living in rural areas and in March of 2023 announced an expanded partnership to provide internet access to 20 million people across Kenya and two additional East African markets by the end of 2025. The Airband Initiative is also working with larger market players like Liquid Intelligent Technologies to enable affordable access across their African footprint and lower the cost of backhaul services and infrastructure for local internet service providers. These partnerships among large, medium, and small companies hold great promise for farmers in Africa to leverage the power of transformative technology fueled by broadband connectivity.



Carefully considering cross-border data regulations and emerging AI technologies

With innovation opportunities come important policy implications within African nations. It is important for policymakers to carefully consider the implications of cross-border data regulations and emerging AI technologies, both of which will be paramount to maintaining the health of these growing dynamics in the tech space³⁵. Localization restrictions implemented across the globe have proven to limit innovation and hinder economic development by restricting access and in some cases threatening data security³⁶. These data concerns also apply to the increased use of e-payment methods and e-phyto certificates for paperless trade. Additionally, new AI technologies—while carrying promise for innovation—should be researched and policy considerations should be weighed³⁷.

Financing for electricity infrastructure projects

While not traditionally associated with smallholder farming practices, financing for electricity infrastructure projects, whether through the U.S. government or through multilateral institutions, is needed to enable emerging technological innovations possible through mobile phone use, drone technology, and e-payment systems. It also allows for electrified cold storage solutions and refrigeration technology that can drastically reduce food waste. Particularly in the current high-interest environment, concessional capital is important for a company's customers to move forward with their final investment decisions. Partnerships that allow for increased flow of this capital and less risk in investment would have significant impacts on their ability to implement more sustainable power solutions across the continent (See issue 1).

GE Vernova: Electrification solutions for sustainable energy sources

GE Vernova is helping the energy sector solve for the energy trilemma of sustainability, reliability and affordability. As a company whose technology helps generate approximately 30% of the world's electricity, they have a meaningful role to play in the energy transition and a strategic imperative to electrify and decarbonize the world. GE Vernova is innovating technology to bring more sustainable energy solutions and improve access to consistent power supply across the African continent including rural areas and small farming communities. For example, GE Vernova's Onshore Wind and Energy Financial Services businesses collaborated with Kipeto Energy Plc to provide turbines and advisory support for its flagship

100 MW wind power project in Kajiado, Kenya. The project, which started generating power in 2020, will produce enough clean electricity to power the equivalent of approximately 40,000 homes, as part of Kenya's Vision 2030. While smallholder farming communities may not be the first to electrify, consistent energy supply in urban regions of Kenya are expected to build demand and increase innovation that will lead to innovations that farming communities need to enhance daily functions. Increased concessional financing will allow for projects like these to expand across the entire country and allow for similar projects to emerge around Africa.



Brambles (CHEP): Circular solutions across the supply chain

First initiated due to ongoing shortages of industrial-grade timber in SSA, Brambles (CHEP) SSA launched a strategy of vertical integration to secure sustainable timber supply to sawmills to create the pallets and containers used to transport agricultural products across Africa. By owning and managing 18 farms in South Africa covering over 13,500ha, including 7,500ha of FSC and PEFC certified pine plantations, Brambles has created a regenerative and sustainably managed solution that serves to absorb carbon and produce oxygen, as well as to mitigate severe weather events, reduce wind speed, prevent soil erosion and reduce climate-change-related risks. These plantations also contribute to holistic biodiversity outcomes, including filtering water and holding moisture, providing base inflows for wetlands and waterways.

Importantly, these serve the local farming communities surrounding each plantation. They offer employment, skills-building, and sustainable livelihoods for communities and increase productivity of farmland through agroforestry.

Brambles' globally certified forest management practices preserve biological diversity while benefiting local people and workers' lives, also ensuring it sustains economic viability for the company. This circular business model facilitates the 'share and reuse' of the world's largest pool of reusable pallets and containers. The model enables Brambles to serve its customers and local communities while minimizing the impact on the environment and improving the efficiency and safety of supply chains around the world.

While significant supply chain shortages and pervasive challenges still exist across the continent, circular business models like those operated by Brambles serve as a practical business solution enabling more responsible trade. By replenishing what it extracts and providing its products via a service, Brambles helps reduce both the constant pressure on natural resources and the waste production typical of conventional linear business models.



Issue 5: Access to off-takers, trade infrastructure, supply chains, and commodity markets.

Value-added skills for agribusiness outside of farming account for 78% of supply chains globally, but only 38% of those in Africa³⁸. Low prices, inability to meet global trade and sanitation standards and SPS regulations, and difficulty accessing international markets all contribute to poor trade infrastructure. Enabling small-holder farmers to trade and export their products for higher profit, as well as import necessary products inexpensively, can vastly improve livelihoods, strengthen food security, and strengthen local and national economies across the continent.

Solutions

Building and maintaining inexpensive transportation systems including natural water routes, canals, railroads, roads, and highway systems

At the most basic level, building and maintaining inexpensive transportation systems—including natural water routes, canals, railroads, roads, and highway systems—will be needed to advance trade. Without these supply routes, trade is rendered impossible. A coordinated implementation strategy should be considered at the supra-national level when possible to ensure efficient cross-border trade in addition to domestic.

Matching with guaranteed or consistent off takers

Increasing access to off-takers, trade infrastructure, and supply chains through which products can be sold and encouraged to compete and innovate is critical for expanding the businesses of small-holder farmers. Matching with a guaranteed or consistent off taker can significantly reduce financial risk and increase access to credit³⁹. It also serves to set standards in production that elevate the quality of products and the way they are handled. Building systems that stimulate efficiency and growth are critical to long-term success and continued financing, and government entities can help with this matchmaking (See issue 1).

Setting consistent quality and safety standards for agriculture products and traded goods

Quality and safety standards that are aligned with global best practices play an important role in developing products and advancing them to a competitive market. One example is the OECD-FAO Guidance for responsible supply chains⁴⁰. As these standards are upheld, off-takers are easier to source, and due diligence can be better enforced. These standards also help farmers access cleaner, safer, and higher-yield products. For example, implementing standards around fertilizer testing, labeling, and registration can help reduce contaminants and increase resilience against weather shocks and soil and crop damage⁴¹. These can be sourced from existing SPS and Gafta standards. Businesses and other partners can help share best practices and lessons learned from other markets. Training on these standards is also an important aspect for effective implementation (See issue 2).

Implementing unitization and setting standards for truck sizes, racks, and other logistics equipment

Unitization, or establishing set standards for truck sizes, racks, and other logistics equipment, is an important step towards reducing logistics costs. Eventually, these standards can contribute to a significant reduction in the percentage of the GDP going towards transportation. Implementing trials in partnership with businesses can help determine suggested sizes for a given country or region, but setting consistent standards throughout trade routes across the continent will be important at every step of the supply chain. This applies to roads and trucks, as well as rail, sea, and air transport.

Diversifying export markets to create more market potential and stabilize export revenues

By diversifying export markets, producers have the opportunity to re-position low-priced products through marketing or business-to-business initiatives as more attractive and at higher price points for more competitive markets⁴². For example, exported crop volumes in horticulture are high, but international market prices are low, thus generating high volume but low value. This is important for creating more competitive products that can earn higher revenues for producers, as well as insulating them from potential price shocks in a single market.

Partnering with the AfCFTA to suggest policy frameworks and support infrastructure development

The African Continental Free Trade Area (AfCFTA) will expand market opportunities for farmers to sell their products, as well as share best practices and farming innovations. Other benefits include increasing access to supply chains and extended trade routes. Investors and government partners should work with the Secretariat of the AfCFTA to suggest policy frameworks and support infrastructure development that will help develop systems suitable for sustainable farming, including energy access and data transfer.



III. Summary

Definitions vary for who qualifies as a “smallholder farmer,” but those operating farmland on 10 hectares of land or less play a vital role in providing nourishment and a living across Africa⁴³. These farmers are estimated to account for over 60% of the population and more than half of the agricultural workforce on the continent, as well as offer a primary source of food for many, with estimates of 80% food production for subsistence farming⁴⁴. Beyond individual food security, agriculture plays a role in broader economic trends and job creation. On average, a 1% increase in agricultural productivity in developing countries generates an increase of 1% in gross domestic product (GDP) per capita⁴⁵.

Small-scale farming systems already grow 50% of food calories on 30% of the agricultural land in Africa⁴⁶. Empowering farmers to be successful will benefit a wide ecosystem of stakeholders, including retailers, off-takers, distributors, and marketplaces. Socially, mechanizing agriculture means that the farmer both spends less time laboring in the field (enabling more time for other productive activity) and can attain higher status in the community due to agribusiness success.

There remains a prevailing poor understanding of the needs of smallholder farmers. The nature and characteristics of smallholder farming systems in Africa are highly diverse⁴⁷. Even where there is greater understanding, policies are not always supportive of root issues faced by these farmers. This paper addresses key problems identified by the private sector with eye towards improving smallholder farming practices in Africa, putting forth overarching recommendations for:

- 1) Using blended financing efficiently and covering all stages of a program from conception to upkeep.
- 2) Adding micro-finance options and strengthening Micro-Finance Institutions (MFIs) to allow for the purchasing of equipment, fertilizers, knowledge transfers and skills training, and increasing service providers for various initiatives.
- 3) Offering credit guarantee schemes for increased access to loans at lower interest rates for smallholder farmers and Agri-SMEs.
- 4) Increasing collateral for loans by formalizing landownership and registration procedures.

- 5) Investing in increased capacity building and financial literacy for farmers and producers.
- 6) Increasing flexibility in U.S. government-led lending regulations, particularly in lending to state-owned enterprises.
- 7) Aligning on standards and processes, including using existing common frameworks and AU initiatives as guideposts where possible.
- 8) Investing in and strengthening agricultural research centers that can help apply best practices and coordinate policies between governments.
- 9) Greater discipline in implementing global best practices for farming.
- 10) Prioritizing investments and implementation strategies for access to higher quality inputs.
- 11) Training on inspection sampling and testing of imported seeds, crops, and food, aligned around SPS and Gafta standards.
- 12) Training on best practices for the management and application of pesticides and microbiological control.
- 13) Employing climate and pest-resistant plant technologies, including genetically modified seeds.
- 14) Aligning standards around climate solutions, including promotion of climate smart agriculture techniques.
- 15) Encouraging government and business site visits to farming communities and trade missions between the U.S. and Africa for increased bilateral knowledge-sharing and best practices for climate smart agriculture.
- 16) Designing holistic and sustainable mechanization strategies through public-private partnerships.
- 17) Partnering on the implementation of local mechanization training centers or other platforms that allow for proper education and training for mechanized equipment.
- 18) Zero-rating any duty or tax on the import of agriculture machinery parts and providing trade facilitation measures.
- 19) Encouraging drip-irrigation systems in communities.

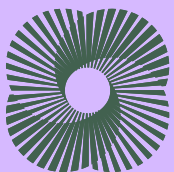
- 20) Funding and educating on water purification and reuse facilities.
- 21) Funding the development of and training for technology-driven initiatives.
- 22) Partnering with agricultural small and medium enterprises (Agri-SMEs).
- 23) Partnering with business associations such as American Chambers of Commerce (AmChams) and other local and national business organizations.
- 24) Implementing electrified or off-grid cold storage solutions.
- 25) Carefully considering cross-border data regulations and emerging AI technologies.
- 26) Financing for electricity infrastructure projects.
- 27) Building and maintaining inexpensive transportation systems including natural water routes, canals, railroads, roads, and highway systems.
- 28) Matching with guaranteed or consistent off takers.
- 29) Setting consistent quality and safety standards for agriculture products and traded goods.
- 30) Implementing unitization and setting standards for truck sizes, racks, and other logistics equipment.
- 31) Diversifying export markets to create more market potential and stabilize export revenues.
- 32) Partnering with the AfCFTA to suggest policy frameworks and support infrastructure development.

Despite concerns about food security in Africa, there is a significant opportunity to improve small-scale farming for large-scale impact. Each of the systemic issues identified within smallholder farming practices can be solved for with engagement from African governments, the U.S. government, Multilateral Development Banks, NGOs, and the private sector. We hope that these recommendations draw increased attention to smallholder farming in Africa and allow for a more sustainable future that will better livelihoods across the African continent and beyond.

Endnotes

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