



PAFO-COLEAD INNOVATIONS SERIES: Innovations and successes of African farmer-led businesses and SMEs

SESSION N°24

Innovation and technology adoption by entrepreneurs

Tuesday 9 September 2025 - 12:00-14 :00 UTC

Online ([Zoom](#))

English-French-Portuguese interpretation available

1. Context

Africa's agrifood sector, a cornerstone of its economies, contributes up to 30% of GDP and employs over 60% of the continent's workforce¹. Despite holding 60% of the world's uncultivated arable land, the continent remains a net food importer, with annual imports surpassing USD 50 billion.² This paradox reflects persistent structural issues due to low adoption of technology and innovation: low productivity, high post-harvest losses, and fragmented value chains. In the face of rapid population growth, urbanisation, and escalating climate threats, transforming Africa's food systems into more resilient, inclusive, and sustainable ecosystems is urgent.

Innovation and technology whether agronomic, digital, or organisational are central to this transformation. Entrepreneurs across the continent are pioneering solutions to modernise agricultural practices, improve soil health, use new mechanisation and equipment tools, enhance value addition, and strengthen market linkages. These include climate-smart irrigation systems, low-horsepower tractors, mechanised planters, threshers, mobile maize shellers, solar-powered milling and drying units, modular cold storage systems, AI-driven crop advisory platforms, drone-based monitoring, blockchain-based traceability tools, and circular economy initiatives that turn waste into value.

¹ World Economic Forum, 2024 <https://www.weforum.org/stories/2024/06/science-based-strategy-key-africa-agricultural-transformation/>

² AFREXIMBANK, Food imports and food security in Africa, <https://media.afreximbank.com/afrexim/Food-Imports-and-Food-Security-Addressing-the-Challenges.pdf>

Agronomic innovations, such as improved seed varieties, regenerative soil management, and biofertilizers, are enhancing productivity and climate resilience. **Mechanical innovations**, from affordable multi-use machinery to small-scale harvesters and rice transplanters, are reducing drudgery and increasing operational efficiency, particularly among youth and women farmers. **Processing innovations** are opening up new economic opportunities, enabling farmers to shift from raw commodity suppliers to food product entrepreneurs.

Digitalisation, in particular, is playing a transformative role by enabling data-driven decision-making, automating key processes, and connecting farmers to information, finance, and markets more efficiently than ever before. However, it is not always without challenges and digital divide risks.

As of 2024, the FAO identified over 390 digital agriculture solutions across Africa, yet the rate of sustained adoption remains disappointingly low. Many innovations remain concentrated in a few countries, with limited scalability and longevity.³

Numerous tools are still donor-dependent or seed-funded prototypes that struggle to survive beyond their pilot phases. Critical barriers including poor internet access, high costs of digital tools, lack of after-sales support, limited access to finance, and weak policy frameworks continue to constrain adoption. These challenges are even more acute for women and youth, who face intersecting barriers such as restricted land access, financial exclusion, and limited digital literacy.⁴

Despite these constraints, a growing cohort of African innovators is proving that context-specific and scalable technologies can drive sustainable growth, improve food security, and bolster local economies.

This session will explore such innovations and examine how to build enabling ecosystems that empower entrepreneurs to innovate, adapt, and thrive. By drawing on real-world examples and lessons from successful adopters, the discussion will highlight the practical conditions, partnerships, and support structures needed to accelerate the adoption of impactful innovations across the continent.

2. Pathways and opportunities for entrepreneurs

Despite significant structural challenges, Africa's agrifood sector presents a growing and dynamic landscape of innovation opportunities. Entrepreneurs are embracing digital transformation to enhance productivity, resilience, and competitiveness. Technologies such as precision agriculture tools, IoT sensors, and AI-based platforms are enabling farmers to monitor crop health, optimize irrigation, and manage inputs more effectively⁵. These tools, when adapted to local agroecological zones, help reduce losses and improve yields, especially in areas vulnerable to climate variability⁶. The integration of satellite data and

³ FAO, Digital Innovation Strategy for Agrifood Systems in Africa, 2024,

<https://openknowledge.fao.org/server/api/core/bitstreams/afebe9b2-2a4b-4832-8273-aea0b4145bc5/content>

⁴ VoxDevLit, Agricultural Technology in Africa, 2024, https://voxdev.org/sites/default/files/2024-04/Agricultural_Technology_Africa_Issue_2.pdf

⁵ ScienceDirect, Digital innovations for African agribusinesses, <https://www.sciencedirect.com/science/article/pii/S277237524000121>

⁶ BiomedCentral, 2022, Adoption of ICT Innovations in Agriculture in Africa, <https://agricultureandfoodsecurity.biomedcentral.com/articles/10.1186/s40066-022-00364-7>

geospatial analytics further supports precision mapping, early warning systems, and improved decision-making along the production chain⁷.

Mechanisation presents another critical frontier. The development and scaling of context-appropriate tools, such as two-wheel tractors, planters, and harvesters are enabling smallholders to overcome labour bottlenecks and reduce manual workloads. Companies and cooperatives offering machinery-as-a-service (e.g., Hello Tractor) are creating new business models that democratise access to machinery, especially for women and youth.

Another growing frontier lies in the digitalization of knowledge services and finance. Mobile-based advisory platforms and digital extension systems are closing information gaps, allowing farmers to receive real-time agronomic advice, weather updates, and market intelligence⁸. Combined with the rise of fintech innovations such as mobile credit scoring, input financing apps, and bundled insurance, these platforms offer new models for inclusive financial access. They are particularly effective in reaching rural populations traditionally excluded from formal banking and insurance systems⁹. The convergence of advisory, finance, and market services into “one-stop” digital ecosystems is helping unlock productivity gains and improve farmer profitability.

Post-harvest innovation is another crucial area where entrepreneurs are making a difference. Processing technologies tailored to small-scale operations, such as solar dryers, modular mills, and cold chain systems powered by renewable energy, enable producers to extend shelf life, add value, and reach higher-value markets¹⁰. Innovations in traceability using QR codes, barcoding, and blockchain are also empowering agrifood businesses to meet the growing demand for transparency in domestic and export markets. These tools enhance branding, build trust with buyers, and support compliance with safety and sustainability standards. **Food processing and packaging technologies** are increasingly decentralised, enabling rural SMEs to compete in more lucrative urban and regional markets.

Waste valorization and circular economy models are also emerging, transforming by-products into biofertilizer, animal feed, or packaging offering new revenue streams while improving environmental outcomes¹¹.

Finally, inclusive innovation must be mainstreamed. This requires co-designing solutions with end users, investing in gender-sensitive product design, and providing flexible access models (e.g., pay-as-you-go, group ownership) that align with the capacities and contexts of local entrepreneurs. When backed by the right conditions, Africa’s agrifood entrepreneurs have the creativity and determination to lead a digital and sustainable transformation of food systems.

⁷ Global Perspectives, 2024, The Role of New Technology in Advancing African Agri-Food Systems

<https://globalperspectives.org/en/the-role-of-new-technology-in-advancing-african-agri-food-systems/>

⁸ FAO (2024). Digital Innovation Strategy for Agrifood Systems in Africa

<https://openknowledge.fao.org/server/api/core/bitstreams/afebe9b2-2a4b-4832-8273-aea0b4145bc5/content>

⁹ AGRA (2023). Africa Agriculture Status Report: Empowering Africa’s Food Systems for the Future https://agra.org/wp-content/uploads/2024/08/Africa-Agriculture-Status-Report-2023-Empowering-Africas-Food-Systems.pdf-compressed.pdf?utm_source=chatgpt.com

¹⁰ Global Perspectives, 2024, The Role of New Technology in Advancing African Agri-Food Systems

<https://globalperspectives.org/en/the-role-of-new-technology-in-advancing-african-agri-food-systems/>

¹¹ NCBI (2023). Impacts of Improved Agricultural Technology on Welfare

<https://pmc.ncbi.nlm.nih.gov/articles/PMC10338978/>

3. Challenges to technology adoption

Although agrifood innovation holds tremendous potential to drive transformation across African food systems, entrepreneurs face a constellation of systemic and operational challenges that constrain widespread adoption and impact.

High costs and limited access to finance remain a critical barrier. Many digital and **climate-smart technologies** require upfront capital investments, which are beyond the reach of most small-scale producers and agrifood SMEs. According to the annual Africa agriculture status report by AGRA¹², less than 10% of agrifood SMEs in sub-Saharan Africa have access to formal bank loans, with even lower figures for women and youth-led enterprises. The World Bank also highlights that rural financial institutions often perceive agricultural lending as high-risk and unprofitable, leading to underinvestment in early-stage innovation¹³.

Infrastructure limitations compound these financial constraints. Rural areas across much of Africa face severe deficits in reliable internet, electricity, cold chain logistics, and physical road infrastructure. These limitations hinder the deployment of IoT-enabled tools, digital platforms, and mechanization especially in last-mile areas. A 2022 review by BiomedCentral on ICT innovation identified poor rural connectivity and weak electricity infrastructure as core constraints limiting the scalability of agricultural technologies¹⁴.

In addition to infrastructure, the human capacity to deploy and sustain innovation is still underdeveloped. Many farmers and entrepreneurs have limited exposure to emerging technologies and lack the digital literacy or technical skills needed to operate, maintain, or adapt them. According to ScienceDirect (2025), the absence of effective training systems and extension services that integrate digital tools reduces the impact of innovation initiatives¹⁵. Moreover, agricultural training systems often lack alignment with entrepreneurial needs, creating a disconnect between skills and market relevance. This gap is especially pronounced in mechanical and processing technologies, where after-sales service and user training are critical for uptake.

Ecosystem fragmentation also remains a major obstacle. Many promising innovations fail to scale because of poor integration between actors such as agritech developers, research institutions, governments, investors, and farmer organizations. The innovation ecosystems that lack intermediary institutions such as accelerators, incubators, or producer organisations often experience fragmented coordination, limited feedback loops, and slow knowledge transfer, all of which constrain experimentation and replication¹⁶.

On the policy front, slow regulatory adaptation hinders the mainstreaming of new technologies. The FAO (2024) points to fragmented standards for data governance, a lack of digital infrastructure investments, and unclear regulations around blockchain and drone technologies as significant deterrents to private-sector engagement.

Finally, social and cultural norms continue to shape the adoption curve. Gender disparities in land ownership, mobile phone access, and time availability limit the engagement of women,

¹² AGRA, <https://agra.org/publications/africa-agriculture-status-report-aasr/>

¹³ World Bank Group, 2020, Harvesting Prosperity: Technology and Productivity Growth in Agriculture <https://openknowledge.worldbank.org/entities/publication/acb134b2-3b82-5ccf-87a0-d6882a53d92e>

¹⁴ BiomedCentral (2022). Adoption of ICT Innovations in Agriculture in Africa <https://agricultureandfoodsecurity.biomedcentral.com/articles/10.1186/s40066-022-00364-7>

¹⁵ ScienceDirect, Digital innovations: Implications for African agribusinesses, <https://www.sciencedirect.com/science/article/pii/S2772375524000121>

¹⁶ OECD (2019). Innovation, Productivity and Sustainability in Food and Agriculture <https://www.oecd.org/en/topics/agriculture-and-fisheries.html>

who constitute most smallholder farmers in many regions. Sociocultural biases limit the diffusion of inclusive innovation, especially where products are not tailored to women's preferences or constraints. Trust in digital tools is also low in some communities, requiring better communication, inclusive design, and demonstration efforts to shift behaviour¹⁷.

4. Way forward

The future of innovation and technology adoption in African agrifood systems hinges on building more inclusive, resilient, and enabling ecosystems. First, governments must prioritize policy reforms that remove bottlenecks to digital agriculture. There is a need to harmonize digital standards, promote open data policies, and scale infrastructure investments, particularly broadband and rural electrification¹⁸ and agricultural mechanisation subsidies. Also, calls for regulatory modernization around blockchain, drone technologies, and biotechnology could facilitate responsible innovation at scale¹⁹.

Improving access to finance remains essential. Blended finance instruments, catalytic grants, and de-risking mechanisms are needed to attract private sector investment and extend affordable credit to early stage agrifood enterprises. Mobile-enabled financial services combined with digital savings and advisory tools are helping expand inclusion, especially among rural entrepreneurs and women farmers²⁰.

At the core of sustainable innovation lies human capital. Agricultural training systems must be realigned with the digital economy, including curricula that develop entrepreneurial, digital, and technical skills. Both formal education and informal channels like mobile-based learning and innovation hubs have a role to play in accelerating capacity development.

Equally important is enhanced collaboration among public institutions, research actors, private innovators, and producer organizations. Stronger linkages and feedback loops foster co-creation, speed up scaling, and reduce fragmentation. Multi-stakeholder platforms can unlock collective action, support infrastructure sharing, and stimulate investment.

Finally, inclusivity must be embedded across the innovation cycle. Designing tools and programmes that meet the needs of women, youth, and marginalized rural groups ensures broader adoption and long-term impact. Pay-as-you-go models, co-creation methods, and gender-responsive approaches are particularly effective in building trust, ownership, and sustainability. When supported by smart policies, robust ecosystems, and inclusive principles, African agrifood entrepreneurs can become drivers of digital transformation and economic resilience across the continent.

Key points for discussion:

- What types of innovations are most impactful for small and medium agrifood entrepreneurs?
- What major challenges in the system make it hard for innovation to be widely used?
- How can financing, policy, and capacity development be designed to foster inclusive technology adoption?

¹⁷ CTA & Dalberg (2019). The Digitalisation of African Agriculture Report 2018–2019

<https://cgspace.cgiar.org/items/fb60e627-208f-4ae1-aba1-40bc2054e856>

¹⁸ FAO (2024). Digital Innovation Strategy for Agrifood Systems in Africa

<https://openknowledge.fao.org/server/api/core/bitstreams/afebe9b2-2a4b-4832-8273-aea0b4145bc5/content>

¹⁹ Farming First (2025). Investments in Innovation Will Help Transform Africa's Agriculture

<https://farmingfirst.org/2025/03/investments-in-innovation-will-help-transform-africas-agriculture/>

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Agenda

- **Moderator:** Ahoefa Soklou, Project officer, Isolina Boto, Head of Departement, Networks and Alliances, COLEAD

12:00-12:10 Introduction

- Jeremy Knops, General Delegate, COLEAD
- Babafemi Oyewole, CEO, PAFO

12:10-12:45 Panel: Agrifood Entrepreneurs driving innovation in Africa

- Samuel Rigu, Founder, Safi Organics Ltd, Kenya
- Bethlehem Dejene, CEO Zafree Papers, Ethiopia
- Steve Hoda, Co-founder AfriCereal Group Sarl, Benin
- Nathaniel Edjeba, Business Coach, Soilless Farm Lab, Nigeria

12:45-13:20 Discussants

- Ousmane Ndiaye, Acting director general of African Center of Meteorological Application for Development (ACMAD).
- Daniel Kyalo Willy, Snr. Manager, Agrobusiness, Policy and Commercialization, AATF

13:20-13:50 Debate

13:50-14:00 Key takeaways and conclusion



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