

Artificial Intelligence: Business Growth Opportunities for Agribusiness in Nigeria





Charles Asiegbu
Research Fellow,
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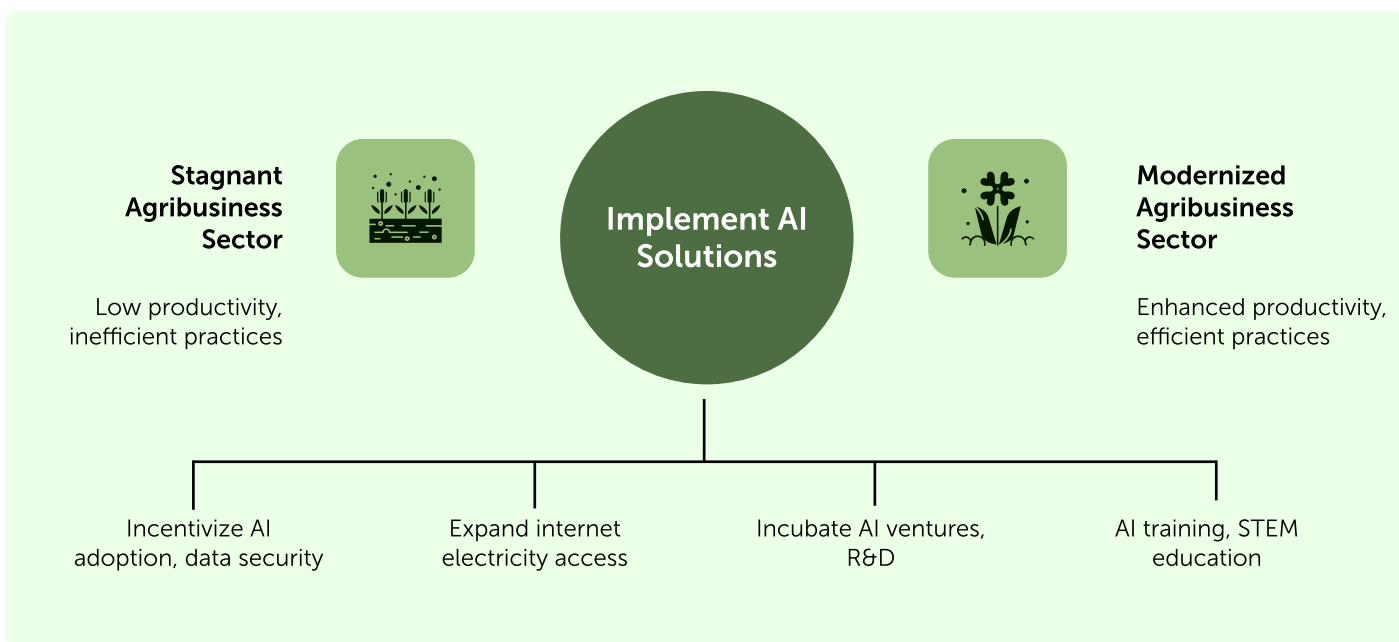
EXECUTIVE SUMMARY

Artificial Intelligence (AI) is reshaping agribusiness and unlocking solutions that enhance productivity, efficiency, and resilience in food systems. Nigeria is uniquely positioned to leverage AI to drive agribusiness transformation, boost food security, and generate jobs, particularly for its young population. The potential is evident in pioneering solutions like Hello Tractor, which has digitised over 3.5 million acres of farmland and created 6,000 jobs. Additionally, CropSense offers real-time insights into soil health, irrigation, and harvest forecasts. These innovations demonstrate the transformative value of AI in Nigeria's agricultural value chain from predictive weather analytics and supply chain management to credit scoring models that unlock financing for smallholder farmers.

Despite this progress, systemic barriers hinder large-scale adoption. Limited digital infrastructure, fragmented data ecosystems, skills shortages, and low investment readiness continue to slow AI integration. Without deliberate intervention, Nigeria risks remaining a passive consumer of agricultural technologies rather than emerging as a regional leader in AI enabled agribusiness innovation.

Unlocking the full potential of artificial intelligence in agribusiness will require coordinated action across government institutions, development partners, financial actors, and technology innovators. Strategic investments in infrastructure, data governance, digital skills, and innovation ecosystems will be essential to move Nigeria from isolated pilot solutions to a fully digitised, competitive agribusiness sector.

Figure 1: Transforming Nigeria's Agribusiness with AI



Source: Author's illustration

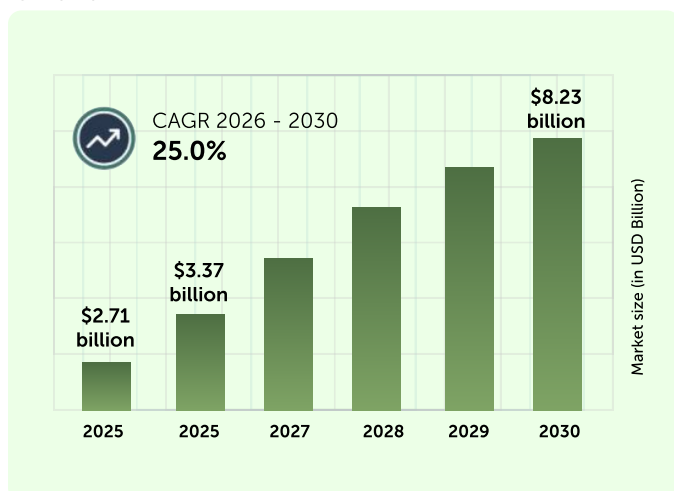


1. Introduction

Artificial intelligence (AI) provides a pathway to transform the agricultural sector in new ways. Globally, AI in agriculture is expected to surge at a compound annual growth rate (CAGR) of 25% between 2025 and 2030, increasing from \$2.71 billion to \$8.23 billion (The Business Research Company, 2024). AI's rapid rise in agriculture is driven by a need for more sustainable farming, labour shortages, rising costs, and escalating food demand. Many businesses are already benefiting from innovative AI solutions, including crop monitoring, soil management, supply chain management, and market forecasting. AI is helping address growing concerns about climate change and market instability.

This global trend is mirrored in Sub-Saharan Africa, where the sector has witnessed phenomenal growth, with private investments. For example, AI platforms like "Hello Tractor" are positively shaping the landscape. Since 2014, Hello Tractor has digitised around 3.5 million acres, increasing food output by 5 million metric tonnes and creating over 6,000 jobs (Laniyan, 2025). Hello Tractor connects smallholder farmers with tractor owners, utilising artificial intelligence to streamline operations. Machine learning tracks tractor usage, forecasts weather patterns, and facilitates communication through text messages in places with limited internet connection. Similarly, CropSense provides farmers with detailed reports on soil fertility, offers advice on irrigation and fertiliser use, tracks plant health, predicts harvest results, and offers personalised guidance through a generative chatbot.

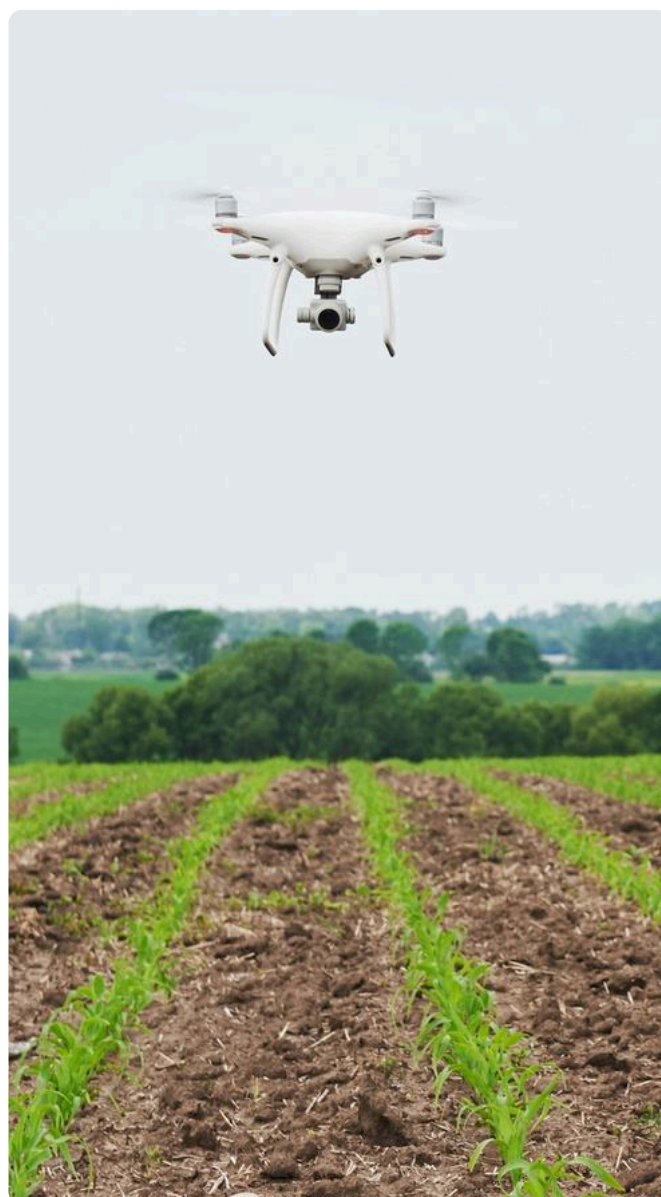
Figure 2: Expected AI in Agriculture Surge from 2025 to 2020



Source: *The Business Research Company*

These developments suggest that artificial intelligence is beginning to reshape agricultural decision making in Nigeria. However, the broader agribusiness ecosystem has yet to fully integrate these technologies at scale.

As a result, this insight explores the emerging opportunities for agribusiness growth in Nigeria through the adoption of artificial intelligence. While early signs of progress are evident, the full potential of AI solutions in the sector remains largely untapped. It examines the current adoption landscape by referencing relevant examples, case studies and success stories. It also acknowledges the hurdles faced in Nigeria's agribusiness and provides solutions and actionable recommendations to hasten AI adoption to catalyse the sector.



2. Methodology

This policy brief relies on secondary data research methodologies. No primary data collection (such as surveys or interviews) was conducted. The analysis is based on a detailed review of publicly available resources, including:

- Published peer-reviewed academic papers and research articles on AI in agriculture and agribusiness in Nigeria and Sub-Saharan Africa.
- Government policy documents include the National Agricultural Technology and Innovation Policy (NATIP 2022-2027) and the National Digital Agriculture Strategy (NDAS 2020-2030).
- Studies and publications from international development organisations, like the Brookings Institution, GSMA Mobile for Development, and BMZ Digital Global.

- Business Research Company and McKinsey & Company produced industry and market research reports.
- Media sources like Business Day and others presented pertinent news and a spotlight on case studies.

Data were compiled using focused keyword searches on Google Scholar, institutional websites, and relevant policy archives. Sources were chosen based on their credibility, timeliness (prioritising publications from 2020 onwards), and direct relevance to AI adoption in Nigerian agriculture.

The analysis is qualitative and interpretive, synthesising secondary sources to identify adoption trends, impediments, and policy options.

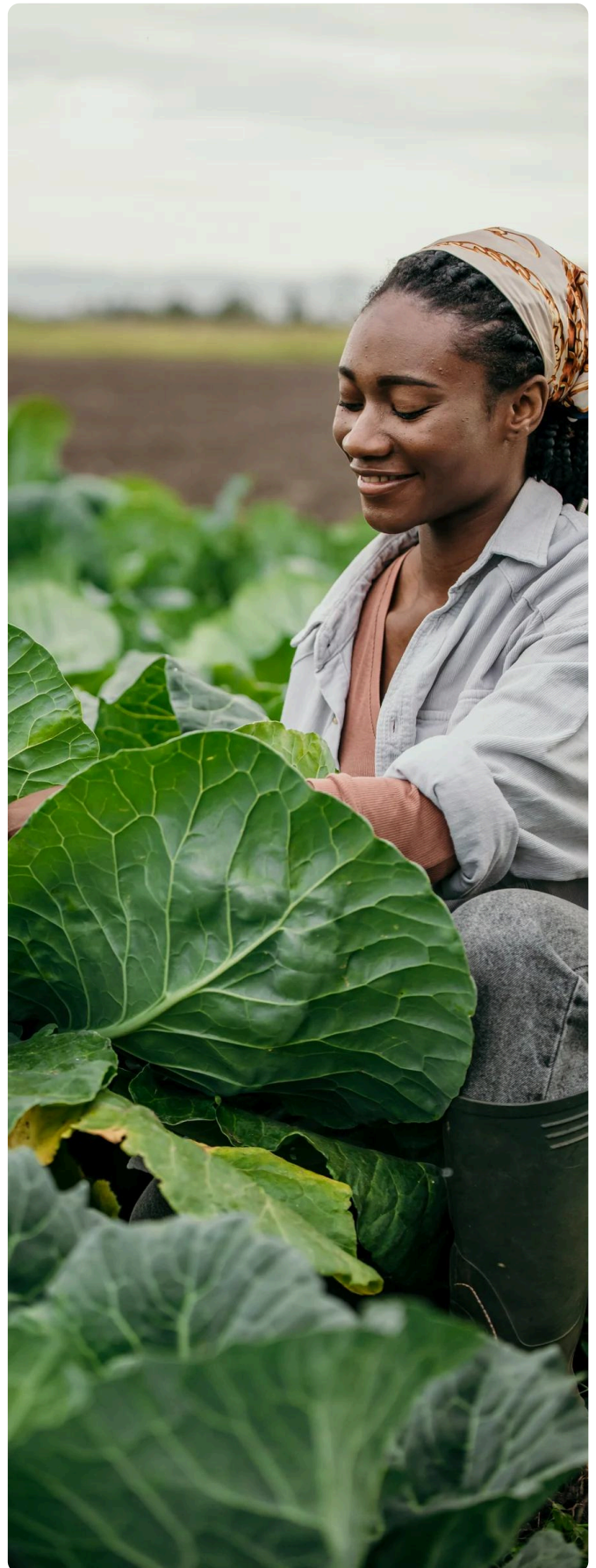


3. Nigeria's Agribusiness Landscape

Nigeria's economy relies heavily on its agricultural sector. The sector employs a vast majority, with current estimates suggesting that 40 million out of over 200 million Nigerians are farmers (Jaiyesimi, 2025). Agriculture contributes approximately 23% of Nigeria's Gross Domestic Product (GDP), underscoring its significant economic impact. Conversations about agriculture typically include agribusiness. As a result, agriculture and agribusiness are used interchangeably. Identifying and interpreting these two phenomena requires a thorough comprehension of their overlaps and dichotomies. Generally, agribusiness builds upon the foundation of agriculture, making the two intrinsically connected. Yet, they refer to different facets of the agricultural sector. At its core, agriculture is the practice of cultivating crops, raising animals, and managing natural resources to produce food.

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Agribusiness, on the other hand, refers to the business aspect of agriculture. Agribusiness is about the economic, financial, and logistical processes that support and manage these activities. In agribusiness, key determinants influencing agricultural productivity include technology, resources, and human capital. Agribusiness leverages innovative technology to optimise production while boosting productivity in countries with above-average agricultural performance. Yet, it faces a range of interlinked challenges that continue to undermine its potential as a driver of economic growth and rural development in Nigeria.



4. AI Adoption Trends in Nigeria's Agribusiness Sector

The Nigerian agribusiness sector is evolving, driven by a new generation of small businesses, rapid technological advancements, and dynamic policy shifts. AI application and adoption for agribusiness is fledgling, both on the policy side and in private companies. However, several initiatives indicate Nigeria's receptivity to AI or at least, digitisation, as demonstrated by both the government and private entities. For example, the National Agriculture Technology and Innovation Policy (2022-2027) of Nigeria's Ministry of Agriculture and Rural Development recognise digital and innovative technologies as cross-cutting interventions for the sector. Part of the strategy is to improve the capacity of various stakeholders in precision agriculture or e-agriculture, which deploys digital technologies to optimise food systems. Artificial intelligence (AI), food blockchain, e-extension services, and tractor rental apps are among the on-farm innovations that will be promoted. According to the strategy, approximately 150,000 non-graduates and over 50,000 graduates will receive the technical support, technology, and capacity they need to participate in profitable and ecologically sustainable agricultural endeavours (Federal Ministry of Agriculture and Rural Development, 2022).

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Additionally, the Nigerian government, through the National Information Technology Development Agency (NITDA), has developed a National Digital Agriculture Strategy. The strategy proposes a Consortium on ICT for Climate-Smart Agriculture, which will be responsible for implementing Information and Communication Technology (ICT) to enhance farmers' and the agricultural community's access to and application of climate-smart digital solutions (National Information Technology Development Agency, 2020). The strategy would house important stakeholders capable of providing novel digital solutions, such as Artificial Intelligence (AI), robotics and autonomous systems, and the Internet of Things (IoT), among others.

For private businesses and individuals, AI is offering solutions for evaluating satellite photos, weather patterns, and soil samples. Farmers use artificial intelligence to determine when to plant seeds, how much to irrigate, and how to combat insects. These decisions, which were previously made based on intuition or inherited practices, are now being refined using predictive analytics and machine learning models. For example, in Cross River State, some farmers are using AI tools such as Farmer.chat to detect and manage pests like aphids that affect pepper crops. The platform also provides weather forecasts that help poultry farmers determine when to heat chicken coops to protect birds from temperature fluctuations.



5. Case Studies

5.1 Predictive Analysis

Every day, agricultural land creates millions of data points that AI can collect and analyse. Investors can now make informed decisions in real time, resolving an age-old problem with the help of AI. Farmers can predict weather conditions in advance, enabling them to choose the optimal time to sow their fields. Water usage is another issue that AI has solved. AI has enabled the evaluation of hybrid seeds and their yields before sowing, reducing the risk of failed harvests and increasing productivity. Due to the small number of people who enter farming, most farms face a skilled labour shortage. Investors and banks lack reliable data on farm yields, soil quality, and creditworthiness. This results in low lending confidence and limited loan penetration. Initially, farms required many workers, most of whom worked seasonally to harvest crops. However, there was a labour shortage as humans transitioned from an agrarian to an urban and suburban society. AI bots helped to alleviate the shortage.

By analysing large datasets, AI can predict weather patterns, pest infestations, and optimal planting times, which improves farm decision-making by reducing uncertainty. AI models can forecast drought conditions, prompting farmers to implement water-saving strategies in advance. For example, Yield Technology Solutions, an Australian agricultural technology company, uses the Internet of Things (IoT) and Artificial Intelligence (AI) to provide hyper-local weather insights and predictive analytics for speciality crops. The solution offers the best available growing conditions data, customised to crops, as well as real-time notifications based on your company's best practices and local growing conditions. Their platform collects real-time data from on-farm sensors and combines it with AI-driven models to deliver actionable insights on irrigation, fertilisation, planting, and harvest.



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5.2 Access to Sustainable Credit

Smallholder farmers in low- and middle-income countries (LMICs) often struggle to obtain formal loans due to a lack of collateral or an established economic identity. However, AI innovation is providing vetted remedies to improve their creditworthiness, allowing financial service providers (FSPs) to be more confident in lending to these farmers.

This invention is gradually eliminating the numerous challenges farmers experience in obtaining the capital necessary to invest in high-quality inputs such as seeds and fertilisers.

For example, an agri-fintech business based in Kenya and Zambia called Apollo Agriculture uses data and AI to evaluate the creditworthiness of smallholder farmers.

Apollo's AI-powered credit assessment engine makes automated, data-driven financing choices for farmers by analysing their trustworthiness using a variety of data sources.

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Apollo's field officers play a critical role in the process. They collect farm and farmer data using Apollo's mobile app, which includes farm size, crop varieties, household information, and farming practices, among other things. This data is then checked for accuracy by a dedicated Data Verification team before being sent into the automated system.

The data, together with satellite imagery and credit bureau records (where available), is utilised to create precise credit scoring profiles for farmers. While data collection and validation are done manually, the ultimate credit decision is completely automated using Apollo's AI models.

Another example is the '[Farmers Credit Scoring Model](#)', created by Kenyan tech firm Pathways Technologies and funded by the European Union and the German government through the Data Governance in Africa Initiative. This initiative is resulting in faster, fairer, and wiser loan decisions. Data is supplied to the AI program, which determines whether a farmer is creditworthy and should be awarded a loan based on crop yields, market sales, and payment behaviour—metrics that genuinely reflect a farmer's potential.

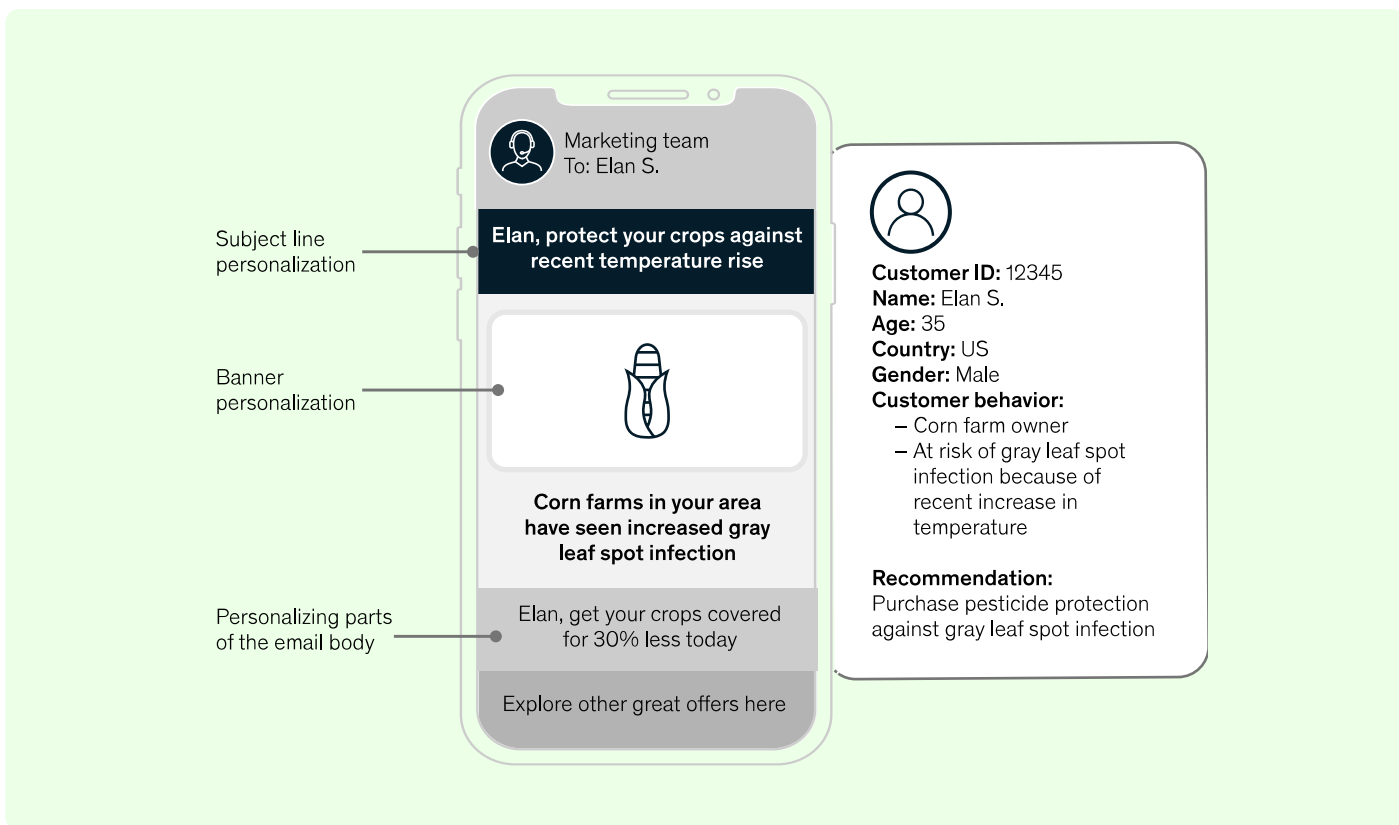


5.3 AI for Agribusiness Marketing

Analytical AI and Generative AI (GenAI) can support marketing and sales domains across pricing and margin management, customer service and experience, sales growth and productivity, and personalised marketing. In pricing and margin management, analytical AI models can microsegment customers and generate price recommendations based on historical willingness-to-pay data. Meanwhile, GenAI can monitor real-time demand, supply, and regulatory shifts to adjust price recommendations accordingly. In customer service and experience, GenAI can provide text responses as the first point of contact in the purchasing journey, helping customers with questions about product selection or sample ordering.

Artificial Intelligence is used to create personalised, real-time marketing content based on each customer's unique interaction history. At the same time, analytical AI can develop and evaluate targeted offers based on value analysis. Such use cases can reduce the cost of creating marketing content and drive revenue growth by enhancing lead conversion through improved customer identification and segmentation.

Figure 3: AI Applications in Agribusiness Marketing



Source: *McKinsey & Company, 2025*

From a marketing perspective, AI-powered digital marketing, in addition to increasing visibility and targeting advertisements, can also help farmers and agribusinesses improve customer engagement. Using digital channels such as social media and email marketing, farmers can interact with their customers in real-time, answer questions and provide updates on products and services.

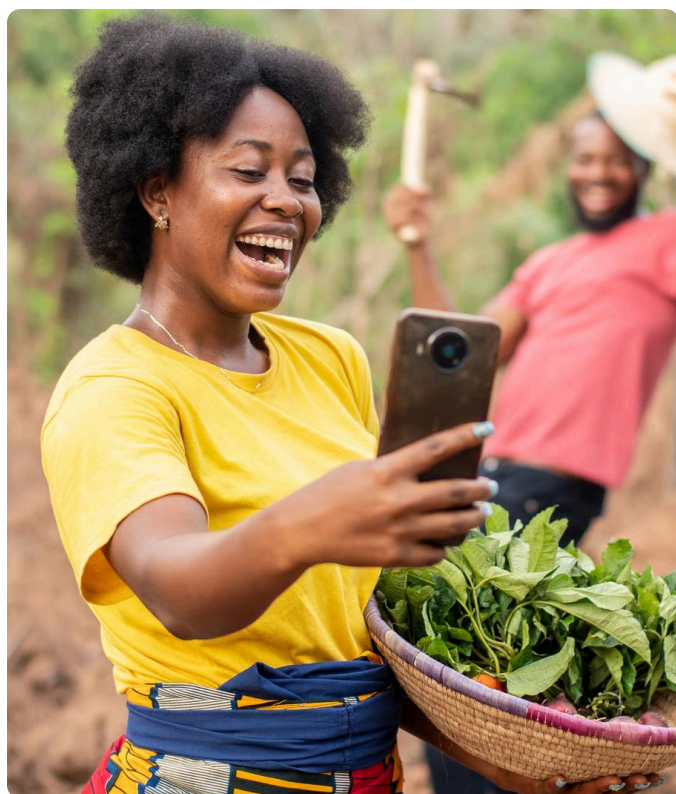
Digital marketing can promote sustainability in the agribusiness sector. By using digital channels to promote sustainable farming practices and eco-friendly products, farmers and agribusinesses can help consumers make more informed choices and reduce the environmental impact of their operations. Despite the numerous benefits of digital marketing in agriculture, the industry also faces several challenges.



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6. Barriers to AI Integration in Nigeria's Agribusiness

Despite growing interest in AI-enabled agribusiness, five structural barriers continue to constrain adoption at scale.



Table 1: Breakdown of Barriers to AI Integration in Nigeria's Agribusiness

<p>Data</p>	<p>AI systems depend on large volumes of accurate, consistent data. Nigeria's agricultural data landscape remains fragmented, with limited coordination between federal ministries, state agencies, and private actors. Cloud computing adoption is constrained by poor internet reliability, high costs, and weak regulation. Only one government-recognised local data provider currently meets localisation requirements. Without a standardised data architecture, AI models cannot be trained on data of the quality needed to address Nigeria-specific agricultural challenges.</p>
<p>Poor Digital and Physical Infrastructure</p>	<p>Unreliable electricity, limited rural broadband, and inadequate road networks create compounding disadvantages for farmers seeking to adopt AI tools. Many AI-powered platforms require real-time data transmission and continuous connectivity conditions unavailable across much of Nigeria's farming communities. Until these deficits are addressed, even well-designed solutions will fail to reach the farmers who need them most.</p>
<p>Low Digital Literacy</p>	<p>Many Nigerian smallholder farmers lack the digital skills needed to operate AI-enabled platforms. This gap is widened by insufficient investment in capacity building, particularly in rural areas. Without targeted training, farmers cannot meaningfully engage with tools for crop monitoring, resource management, or predictive analytics limiting adoption and return on investment across the agritech ecosystem.</p>
<p>Skills Shortage in AI and Agronomy</p>	<p>Developing and maintaining AI solutions for agriculture requires professionals who combine expertise in data science with deep knowledge of farming systems. Nigeria currently has a limited pipeline of such multidisciplinary talent, increasing dependence on foreign technology providers and raising the cost of deploying locally tailored solutions.</p>
<p>Limited Access to Finance</p>	<p>Many financial institutions continue to classify agriculture as high-risk, restricting farmers' access to credit needed to invest in AI-powered inputs and services. Low uptake of agricultural insurance compounds this problem, leaving value chain actors exposed to losses and less willing to adopt new technologies.</p>

7. Recommendations

Addressing these barriers will require coordinated action across three actor groups. The following recommendations are prioritised by urgency and designed to build on each other sequentially.

Table 2: Recommendations to Integrated AI in Nigeria’s Agribusiness

For the Federal and State Governments		
Strengthen Digital Infrastructure	Operationalise the National Digital Agriculture Strategy	Institutionalise AI-driven Foresight in Policymaking
Expand broadband coverage to rural farming communities and ensure a reliable electricity supply. The Federal Ministry of Communications should lead public–private partnerships to build last-mile digital infrastructure, with state governments identifying priority agricultural corridors. Establish clear connectivity benchmarks with annual progress reporting to the National Assembly.	Fast-track full operationalisation aligned with NATIP 2022–2027. Include dedicated provisions for AI integration, standardised data governance protocols, and tax or grant incentives for qualifying agritech innovators. The Federal Ministry of Agriculture should publish an implementation scorecard within 12 months of adoption.	Embed horizon scanning, scenario planning, and trend analysis into agricultural policy processes to enable adaptive responses to climate shocks, market shifts, and emerging technologies. Engage the Nigerian Economic Summit Group and research institutions as technical partners.
For Development Partners and Multilateral Agencies		
Fund Multidisciplinary Skills Development	Promote Inclusive Multilateral Cooperation	Invest in Localised AI Solutions
Commission and co-fund training programmes merging AI, data analytics, and agronomy to build a pipeline of professionals capable of deploying locally relevant solutions. Priority cohorts should target youth and women. Partner with Nigerian universities and TVET institutions to embed modules into existing curricula and track graduate employment in the agritech sector.	Facilitate knowledge-sharing platforms, collaborative research, and access to open-source AI tools to reduce dependence on proprietary systems. Prioritise South–South cooperation with Kenya, Ghana, and Rwanda where agritech ecosystems are more mature to accelerate Nigeria’s transition to climate-smart agriculture.	Fund the development of affordable, offline-compatible, and vernacular-language AI platforms that reflect the realities of Nigeria’s fragmented agricultural systems. Track accessibility and smallholder adoption rates as primary success metrics, not just platform deployment.



For the Private Sector and Agritech Innovators		
Scale AI-driven Credit and Insurance Models	Leverage AI for Agribusiness Marketing	Build a National Agricultural Data Repository
<p>Collaborate with financial institutions to expand AI-powered credit scoring and risk assessment, increasing access to microloans, crop insurance, and financial literacy programmes. The Apollo Agriculture and Pathways Technologies models offer proven templates for adaptation to the Nigerian context. Measurable targets should include loan penetration rates and insurance uptake among smallholders.</p>	<p>Deploy generative and analytical AI to enhance market intelligence, dynamic pricing, and customer engagement. Develop tools that enable farmers and agribusinesses to capture greater value in domestic and export markets, with measurable targets for revenue growth and customer conversion rates.</p>	<p>Lead or co-invest in a standardised, centralised system for agricultural data collection and storage. Agree interoperability standards with NITDA and the Ministry of Agriculture to ensure data can be used across platforms and by researchers, policymakers, and commercial actors alike to improve AI model quality over time.</p>

8. Conclusion

Artificial Intelligence is steadily transforming Nigeria’s agricultural sector, enabling smarter decisions, improved yields, and expanded market access across the value chain. The examples of Hello Tractor and CropSense demonstrate what is possible when technology is thoughtfully applied to local agricultural realities. Yet, adoption remains uneven, and the structural barriers, infrastructure gaps, fragmented data, skills shortages, and limited financing will not be resolved without deliberate, coordinated action.

Nigeria has both the scale and the ambition to become a continental leader in AI-driven agribusiness. Realising that potential will require the government to invest in enabling infrastructure and clear policy frameworks; development partners to build locally grounded capacity; and private sector actors to design solutions that work for smallholder farmers, not just large commercial operators.

If these elements come together with urgency and coordination, Nigeria can build a more resilient, competitive, and food-secure agricultural economy, one that creates opportunity for millions of Nigerians and establishes the country as a regional model for AI-enabled agribusiness transformation.



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