AgriTech in Nigeria

Investment opportunities and challenges

GSMA AgriTech Programme

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The GSMA AgriTech Programme works towards equitable and sustainable food chains that empower farmers and strengthen local economies. We bring together and support the mobile industry, agricultural sector stakeholders, innovators and investors in the agritech space to launch, improve and scale impactful and commercially viable digital solutions for smallholder farmers in the developing world.

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A note on the use of "start-up" and "company"

This report covers a number of agritech businesses in Nigeria, some of which are established companies and some are start-ups (i.e. “a young company founded by one or more entrepreneurs to develop a unique product or service and bring it to market”, according to Investopedia). To ensure consistency, “agritech company” is used to denote either a start-up or established company in the agritech sector in Nigeria.

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Executive summary

In recent years, Nigeria has seen a proliferation of agritech companies aiming to address the challenges faced by smallholder farmers and to improve their livelihoods through better access to inputs, credit, assets and markets. Some of the companies offering these innovative digital solutions include Farmcrowdy, Thrive Agric, AgroMall, Hello Tractor and Crop2Cash, among others.

While the Nigerian government has launched several policies in recent years to stimulate the agricultural sector, such as increasing the number of loans available to farmers, these policies were not designed to support the growth and scale of agritech companies and solutions. Although some Nigerian agritech start-ups have become established companies, few have scaled. Barriers include a challenging business environment, an ecosystem not geared to support long-term growth, low levels of agricultural knowledge and skills and limited access to funding opportunities.

A range of funders and support organisations are active in the Nigerian agritech space, such as incubators, accelerators, angel investors and donors, which typically invest at early funding stages. However, mid- and late-stage investors, such as impact investors, venture capital firms, private equity firms and large corporates, have so far shied away from Nigerian agritech due to the perceived risk of investing in agriculture and the opportunity cost compared to other sectors.

While some funding is available in early stages, Nigerian agritech companies face three major funding gaps: limited availability of local capital, a lack of institutional investors investing in agritech and an inability to attract big-ticket investments. Both local and foreign investors can influence the agritech sector from an early stage, but this may require patient capital and greater awareness of agritech business models and their impact. Start-ups should seek long-term and patient engagement with investors to raise awareness of the benefits their digital solutions could bring to farmers, and how investors might benefit from working with them.

Companies such as AFEX and AgroMall have worked effectively through government initiatives to stimulate rural financial inclusion by using their digital solutions to provide loans to smallholder farmers. However, government policy has potential to go further by encouraging investment in agritech. The Nigerian government could support the agritech sector by creating an enabling environment for innovation, primarily for digital financial services and mobile money uptake. The agritech sector stands to benefit from the development of physical and financial infrastructure to support the agricultural ecosystem, as well as from policies designed to improve the basics of the business environment and attract investment.

1 Introduction

In the 1960s, Nigeria was one of the most promising agricultural producers globally. Export crops dominated foreign exchange earnings; the country was the top palm oil exporter worldwide and was responsible for almost half the world's groundnut production.[1]

Nigeria's agriculture sector has since seen a steep decline. Whereas the country once grew around 18 per cent of the world's cocoa, its share of production is now down to eight per cent. Once responsible for producing 65 per cent of tomatoes in West Africa, Nigeria is now one of the largest importers of tomato paste.[2] Over the last 20 years, a decline in groundnut, palm oil, cocoa and cotton production has led to a missed opportunity of around $10 billion in export earnings.[3] Increases in crop production have been outstripped by population growth, leading to a reliance on food imports and a decline in economic self-sufficiency.

Despite experiencing an oil boom from the 1960s onward, agriculture has remained vital to Nigeria's economy, accounting for around a quarter of gross domestic product (GDP) and employing up to 36 per cent of the country's working population.[4] Key crops include rice, wheat, maize, cotton, soybeans and cassava. Rice remains an essential staple for most Nigerians, with around seven million tonnes consumed annually.[5] The country is Africa's leading consumer of rice and one of its largest producers, and one of the largest importers of rice globally. Nigeria is also the largest global producer of cassava, producing around 50 million metric tonnes annually. Both crops are grown predominantly by smallholder farmers, who sell around 80 per cent of their harvest. Large-scale commercial plantations are rare.

Since the 1970s, agriculture in Nigeria has faced numerous challenges that have resulted in low yields and post-harvest losses. These challenges include: limited access to land for smallholder farmers, an over-reliance on rain-fed irrigation, limited adoption of modern technology, inadequate storage facilities and poor access to markets.[6] Expensive and poor-quality inputs, and limited access to credit facilities, have exacerbated the situation, leaving Nigeria, a former agricultural powerhouse, with low agricultural productivity compared to its neighbours. The average yield for cereals in Nigeria is 1.46 metric tonnes per hectare while Ghana produces 1.87 metric tonnes per hectare and Côte d'Ivoire produces 2.15 metric tonnes per hectare.[7]

In recent years, a growing number of agritech companies have begun offering digital solutions to address the challenges faced by smallholder farmers in Nigeria. These solutions aim to improve smallholder farmers' access to financial services, farm inputs (e.g. as good-quality seeds), fertilisers, insecticides and pesticides, and equipment (e.g. tractors), as well as provide other extension services to farmers. Many agritech solutions improve farming methods and introduce best practices,

1 Green, A. R. (8 August 2013), *Agriculture Is The Future of Nigeria*. Forbes.
2 Ibid.
3 Food and Agriculture Organisation (FAO) in Nigeria.
4 Ibid.
5 Russon, M. (12 April 2019), *Boosting rice production in Nigeria*. BBC.
6 Ibid.
7 World Bank DataBank.

while monitoring farmers' progress from the start of the farming season through to harvest. New digital tools are also enabling farmers to access markets by connecting them with produce buyers.

The growing number of agritech companies across Sub-Saharan Africa has led to an increase in agritech investment. In 2019, around $63 million was invested in agritech in Africa.[8] Kenya, Nigeria and Ghana are the most vibrant agritech markets, collectively accounting for 60 per cent of active start-ups in Africa. West Africa is now home to two of the top three agritech ecosystems on the continent.[9]

Nigerian companies, including Farmcrowdy, Thrive Agric, AgroMall, Hello Tractor and Crop2Cash, have benefitted from grant funding to achieve social impact. Some have even attracted commercial investment.[10] These companies have launched digital solutions that aim to improve farmers' access to markets, finance, assets and actionable data-driven information (Figure 1). Farmcrowdy and Thrive Agric offer platforms for the general public to crowdfund farmers while Hello Tractor offers a shared tractor service. AgroMall uses farmer data to generate economic identities for farmers while Crop2Cash's solution digitises entire value chains and provides digital payments.

Figure 1

Examples of agritech companies in Nigeria

AFEX

AFEX uses commodities produced by farmers as capital by generating tradeable electronic warehouse receipts to increasing the bargaining power of farmers and linking them to agronomic education, access to inputs and credit.

AgroMall

AgroMall supports smallholder farmers by using digital tools to provide effective agronomic advisory, extension services, management and engagements in agricultural value chains.

BeatDrone

BeatDrone uses drones across a number of sectors. In agriculture, its drones are used to help farmers improve their yield. The drones are used to spray pesticides on farms, engage in crop supervision, and map farmlands.

Crop2Cash

Crop2Cash is a platform that improves smallholder farmers' access to formal financial services. Crop2Cash also provides a digital payments solution to farmers through its partnership with First City Monument Bank.

Farmcrowdy

Farmcrowdy is a digital agricultural platform that connects farm sponsors with farmers. Farmers can use the sponsors' funds to complete a full farming cycle. Sponsors are able to track farmers through periodic updates.

Hello Tractor

Hello Tractor is an agritech company that focuses on connecting tractor owners and smallholder farmers through a farm equipment sharing platform.

Thrive Agric

Thrive Agric is a digital crowdfunding platform that provides farmers with the finance they need to grow their businesses. The platform offers the general public the chance to invest their money in smallholder agriculture.

TradeBuza

TradeBuza is a cloud-based web and mobile-based platform that helps clients to manage the visibility of their outgrower schemes and trade commodities more effectively.

Verdant AgriTech

Verdant AgriTech offers a mobile-based digital solution to farmers that provides market information, managerial support and access to markets to smallholder farmers.

8 Maxime Bayen
9 Shapshak, T. (9 May 2018), *African Agri-tech Start-ups Boom With 110% Growth Since 2016*. Forbes.
10 Essiet, D. (26 December 2019). *Booming start-ups scene*. The Nation (Nigeria).

Donors, angels, innovation hubs and non-governmental organisations (NGOs) have all supported Nigerian agritech companies in the early funding stage, but the funding landscape is likely to become more complex as technology companies seek to scale further. Institutional investors offering higher investment ticket sizes, such as impact investors, development finance institutions (DFIs), venture capital and private equity firms, have so far refrained from investing in agritech. Instead, these investors are largely concentrated in sectors such as energy, fintech and education.

This report analyses the evolution of agritech investment in Nigeria, and the role different investors have played in the growth of the sector. Using both primary and secondary research, we highlight the investment trends in Nigerian agritech, the types of funding gaps and possible opportunities for agritech companies to grow further. This report also looks at opportunities for investment to "crowd in"[11] additional resources.

11 "Crowding in" refers to investment from one source stimulating additional investment from other sources.

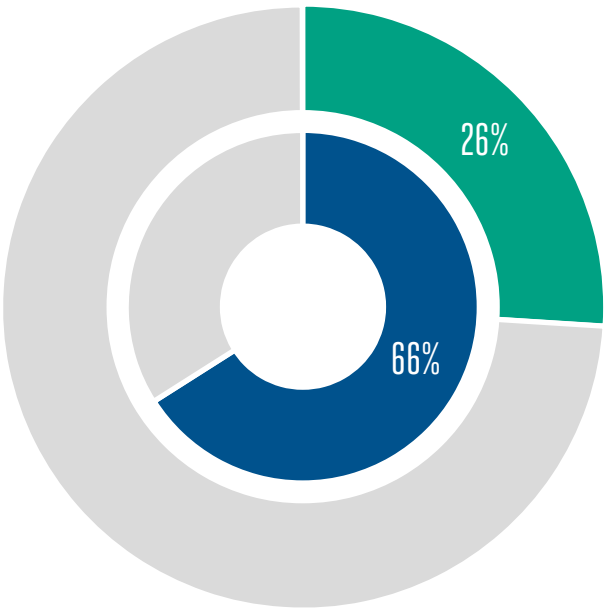
2 Agriculture in Nigeria

Despite an oil boom over the last four decades, agriculture remains the core of the Nigerian economy and the main source of livelihood for most Nigerians. As of 2019, agriculture contributed around 26 per cent to the country's GDP, up from around 20 per cent in 2018 (Figure 2).[12]

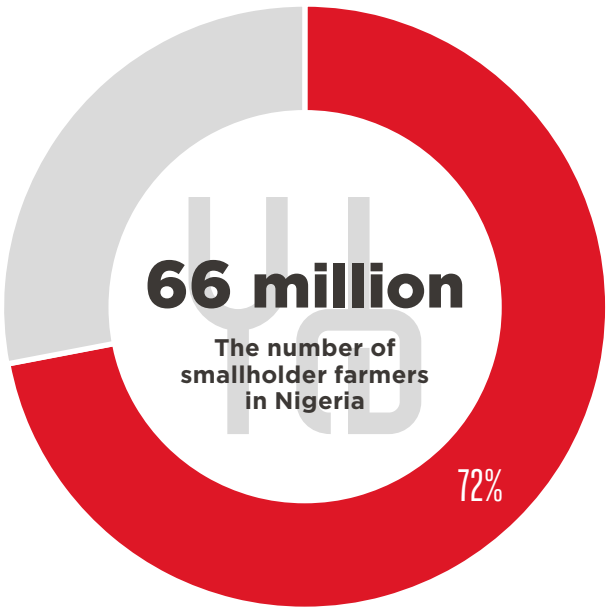
Figure 2

Statistics on agriculture and smallholder farmers in Nigeria, 2019

Agricultural contribution to GDP and proportion of labour force engaged in agriculture



Proportion of smallholder farmers living below the poverty line ($2/day)



Agriculture's contribution to Nigeria's GDP, 2019

Proportion of labour force engaged in agriculture

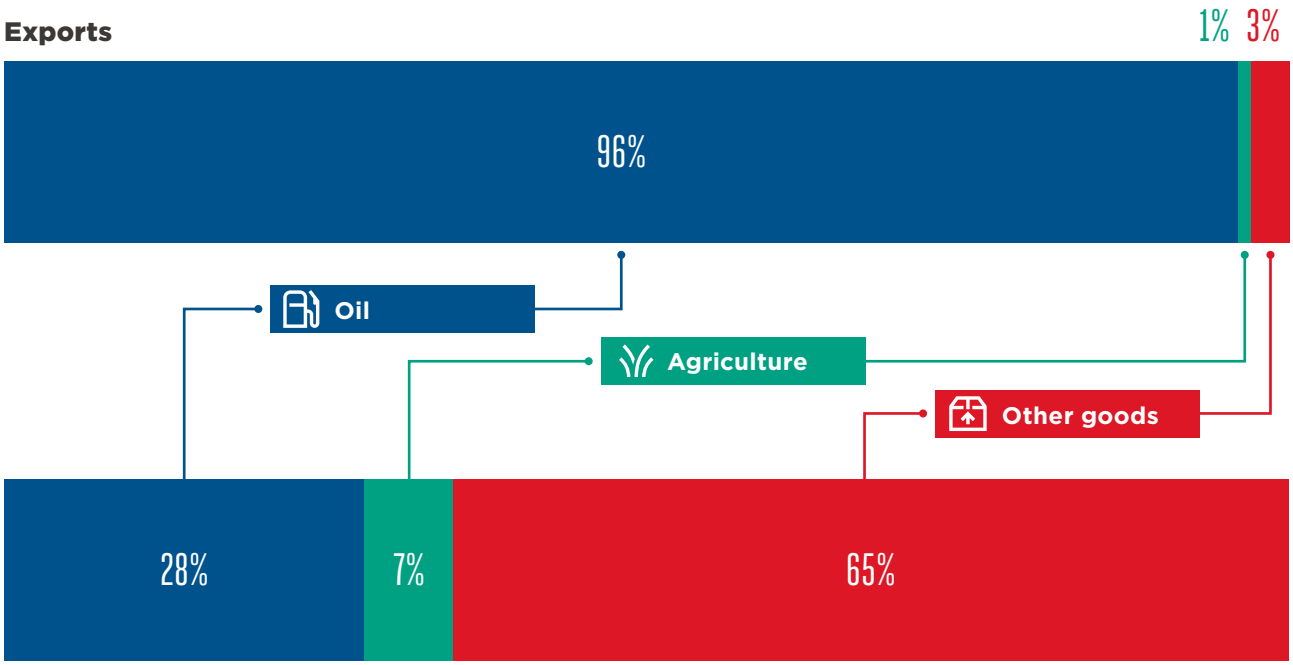
Sources: National Bureau of Statistics, Nigeria; FAO Nigeria Country Profile; Mastercard Foundation Rural and Agricultural Financing Learning Lab and ISF Advisors (2019), *Pathways to Prosperity: 2019 Rural and Agricultural Finance State of the Sector Report*.

12 National Bureau of Statistics Nigeria (2019), *Nigerian Gross Domestic Product Report Q3 2019*.

Prior to the end of the Nigerian Civil War in 1970, Nigeria was both self-sufficient in food production and a major food exporter. Since then, food imports have outstripped exports. As of 2017, agriculture accounts for one per cent of Nigeria's total exports while seven per cent of all imports are agricultural produce (Figure 3).[13] At the end of 2018, fermented cocoa beans were the only agricultural item featured in the list of top 10 items exported. Conversely, durum wheat, wheat seeds and cane sugar — all crops that Nigeria is capable of producing at scale — featured among the top 10 imports.[14]

Figure 3

Nigeria's total exports and imports, 2017



Source: World Integrated Trade Solution (WITS), 2020

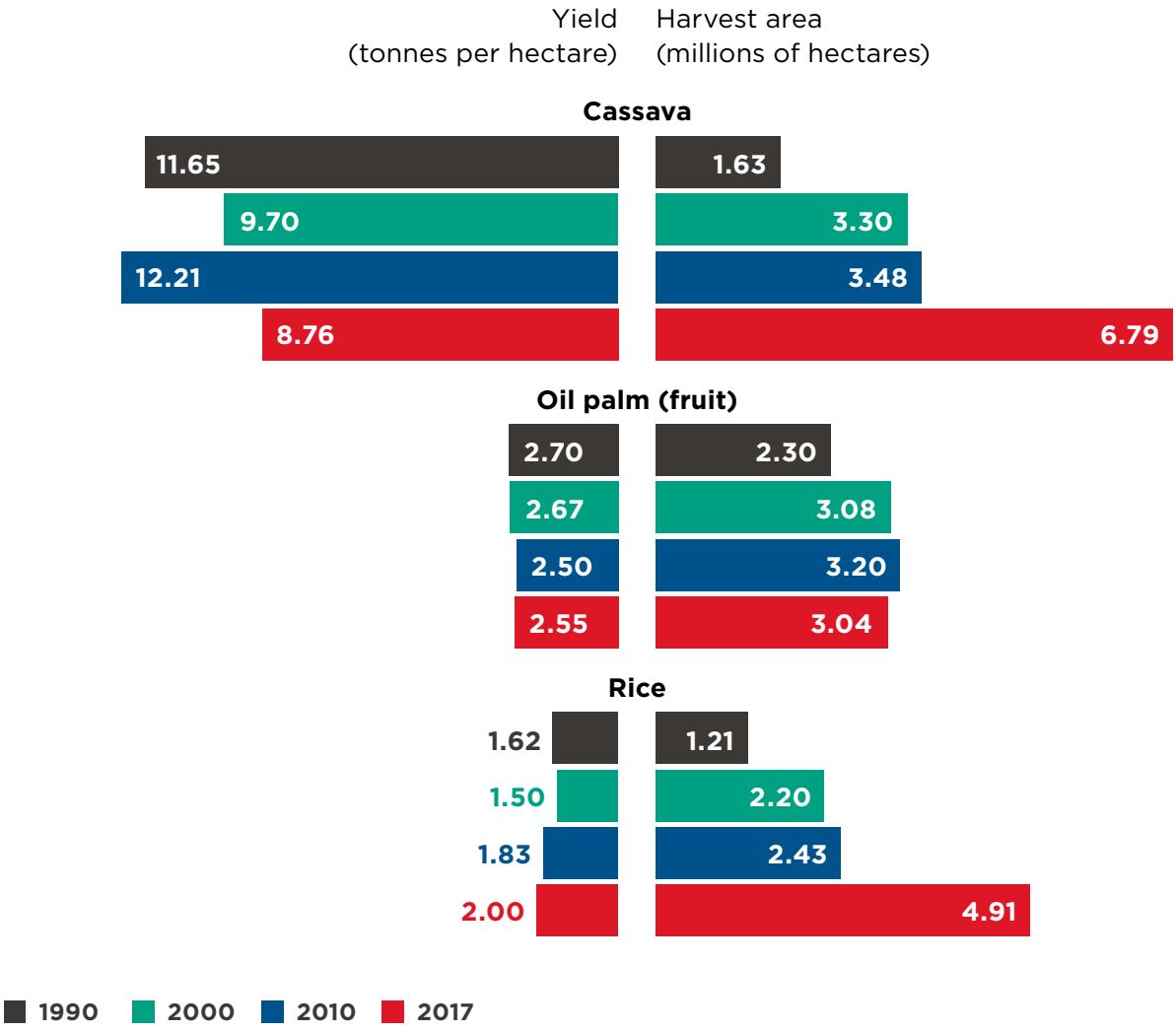
13 World Integrated Trade Solution (WITS): https://wits.worldbank.org/
14 National Bureau of Statistics Nigeria.

2.1 Comparing Nigeria's agricultural yields and harvest areas

While a handful of commercial farms practice intensive agriculture, around 90 per cent of domestic output is produced by smallholder farmers — most of whom grow their crops on one to three hectares of land, on average.[15] Since 1990, land use for agriculture has increased across major crop value chains, such as cassava, oil palm and rice paddy (Figure 4). This has been driven primarily by an increase in subsistence farming. At the same time, the yields of most key crops have remained stable or declined, a sign of low use of improved seedlings and agrochemicals, and inadequate adoption of technology. However, government subsidies for rice, which is considered a major staple crop, have resulted in marginally higher yields.[16]

Figure 4

Agricultural yields and harvest areas, 1990–2017



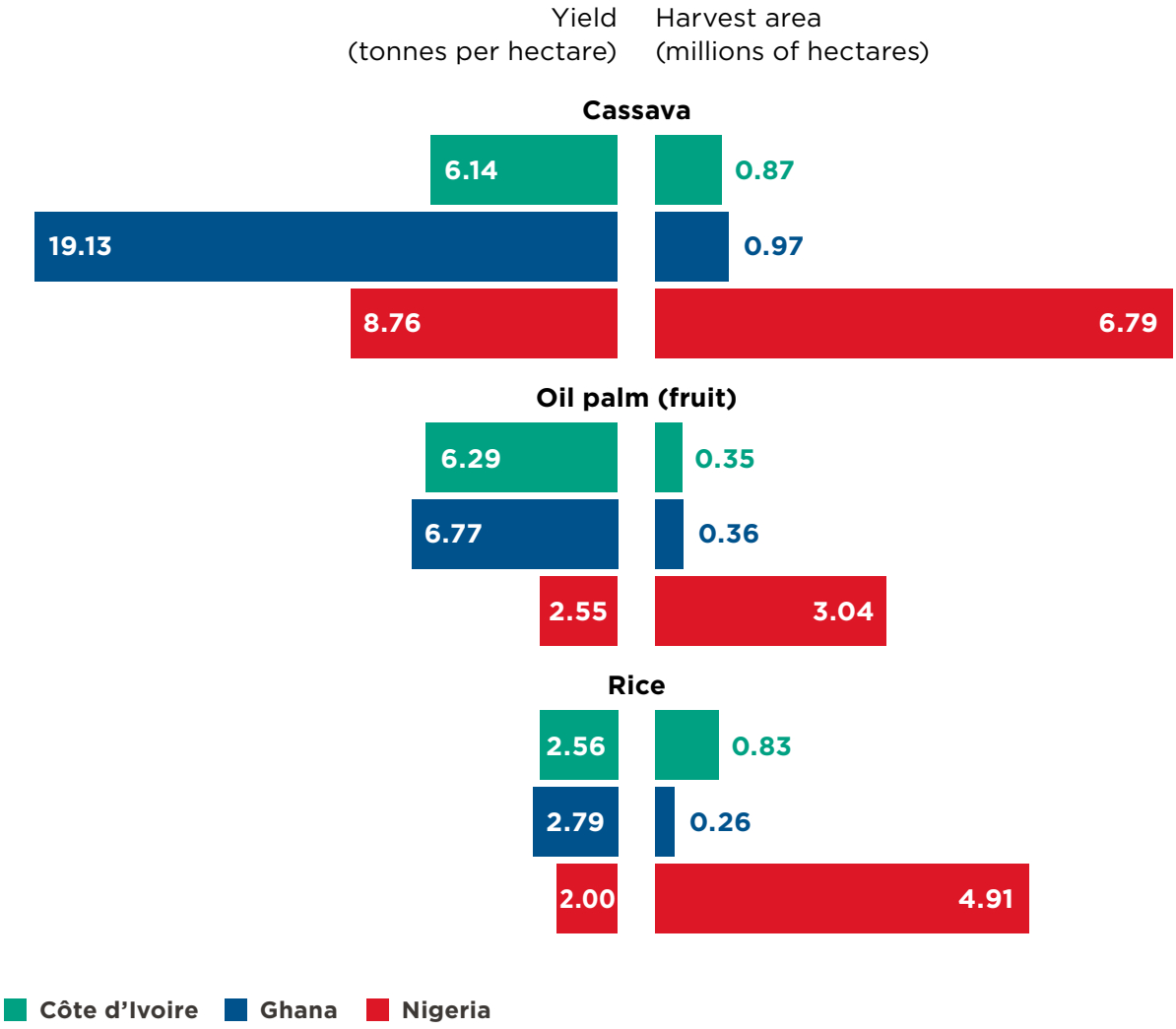
Source: FAOSTAT, 2020

15 Unah, L. (4 May 2018), *Agritech startups aim to lift Nigerian smallholder farmers out of poverty*. Devex.
16 PwC Nigeria (2017), *Transforming Nigeria's agricultural value chain*.

Compared with neighbouring countries in West Africa (Figure 5), Nigeria not only has higher rates of land use for most crops, but also comparatively low agricultural yields. Unlike Côte d'Ivoire and Ghana, Nigeria has been slower to adopt new technology that could generate higher yields and production levels.

Figure 5

Agricultural yields and harvest areas in Nigeria, Ghana and Côte d'Ivoire, 2017



Source: FAOSTAT, 2020

A number of other challenges have contributed to low productivity rates in Nigerian agriculture. High dependency on rainfed agriculture means that smallholder farmers are increasingly vulnerable to climate variability. A rise in unpredictable weather patterns, and more frequent, harsher weather conditions are likely to have a significant impact on smallholder farmers in Nigeria.

The challenges for smallholder farmers are exacerbated by their inability to access both short-term working capital loans for agricultural inputs and long-term capital for crop improvements, irrigation systems and other farm investments. Despite accounting for about a quarter of Nigeria's GDP, agriculture received less than four per cent of all credit provided by commercial banks in 2018.[17] Overall, Nigerian farmers have struggled to borrow money affordably without government support.

17 PwC (2018), *Evaluating Agriculture Finance in Nigeria: Towards the US$1 trillion African food market by 2030*.

2.2 Agricultural development initiatives

Following an oil crisis in the 2010s that led to declining oil-based revenues, the Nigerian government embarked on a policy of economic diversification. Agricultural development is a key goal, especially due to the country's heavy reliance on food imports. A variety of agricultural initiatives have been launched, including ones promoting the use of digital technology in agriculture, leading to a nascent agritech sector (see section 3).

From 2011 to 2015, the Nigerian government implemented the Agricultural Transformation Agenda (ATA), which sought to support agriculture by introducing business-like practices to the sector. The policy prompted a renewed interest in agriculture, particularly among investors. One of the policy's key achievements was to restructure the nationwide fertiliser procurement system.[18] To combat inefficiencies and fraud with the input subsidy scheme, the government established the Growth Enhancement Support Scheme (GESS) in 2011. Through the GESS, farmers received vouchers for subsidised fertilisers and seeds directly on their mobile phones through an electronic wallet provided by Cellulant, a mobile payments provider.[19] Cellulant was later selected by the Federal Ministry of Agriculture and Rural Development (FMARD) as part of the Nigeria Agriculture Payment Initiative (NAPI) to digitise agricultural payments and improve rural financial inclusion.[20]

Following the ATA, the government launched the Agriculture Promotion Policy (2016–2020) in 2015, as well as several agricultural development initiatives. These include: the Anchor Borrowers Program (ABP), the Presidential Fertilizer Initiative (PFI), the Youth Lab, the Presidential Economic Diversification Initiative (PEDI), the Food Security Council and the Nigeria Incentive-Based Risk Sharing System for Agricultural Lending (NIRSAL).[21]

Created by the Central Bank of Nigeria (CBN) in 2017, the ABP works in partnership with state governments and private sector organisations to provide farm input loans and cash for farm labourers and smallholders to boost agricultural production. At harvest time, farmers send their produce to off-takers or agro-processors (the anchors) who then pay the cash value of the crops into the farmers' accounts, less the cost of the loans provided. While typical bank loans carry an interest rate of 30 per cent, ABP loans have a lower rate of nine per cent. As of June 2019, around 1.1 million farmers producing 17 different agricultural products had participated in the programme. [22]

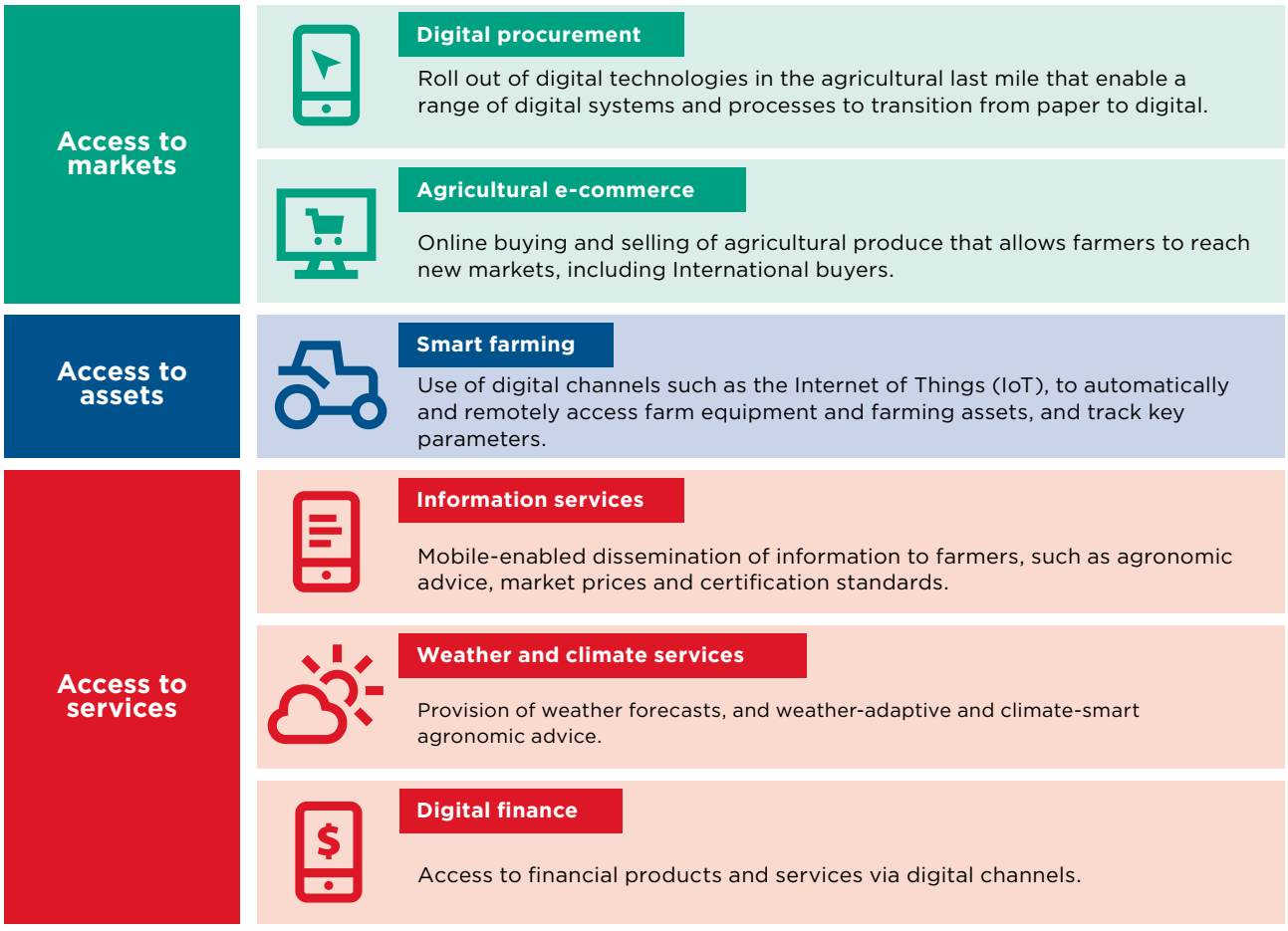
18 Tralac (25 July 2016), *Nigeria: Agriculture Promotion Policy 2016–2020*.
19 Tricarico, D. (2016), *Market size and opportunity in digitising payments in agricultural value chains*. GSMA.
20 Ibid.
21 International Trade Administration, *Nigeria – Agriculture*.
22 Sumaila, M. (26 September 2019). *CBN empowers 1.1m farmers through anchor borrowers programme*. NNN.

3 The emergence of the agritech sector

In developing countries, a range of digital agricultural solutions have emerged to improve smallholder farmers' access to markets, assets and services (Figure 6).

Figure 6

Types of digital agricultural solutions[23]



23 Loukos, P. (2020), *The GSMA AgriTech Toolkit for the Digitisation of Agricultural Value Chains*. GSMA.

Over the last three years, government efforts to improve Nigeria's agricultural sector have led to the rise of a range of agritech companies. These companies offer a variety of digital solutions to address the challenges faced by the agricultural sector and improve the livelihoods of smallholder farmers (Figure7).

Figure 7

Examples of Nigerian agritechs

Company	Founded	Use cases	Cumulative users*
AFEX	2014	Digital procurement, Digital finance	106,000
AgroMall	2016	Digital procurement, Digital finance	530,000
BeatDrone	2015	Smart farming	300
Crop2Cash	2018	Digital procurement, Digital finance	1,000
FarmCrowdy	2016	Digital procurement, Digital finance	25,000
Hello Tractor	2014	Smart farming	5,000
Thrive Agric	2016	Digital procurement, Digital finance	22,000
TradeBuza	2018	Digital procurement, Digital finance	2,000
Verdant AgriTech	2014	Information services	8,000

Digital procurement | Smart farming | Digital finance | Information services

* Cumulative users refers to the total number of historical users up to November 2019.

Source: GSMA AgriTech programme

3.1 The impact of government policy on the growth of agritech

Through its Agriculture Promotion Policy, the Nigerian government highlighted a need to "commercialise new agricultural technologies that meet local market needs".[24] However, the government's programmes to improve access to agricultural finance have had a greater impact on agritech in Nigeria than its policies.[25] For instance, although not designed to benefit agritech specifically, government-backed incentives like the ABP have aided the growth of Nigerian agritech companies, such as AFEX and AgroMall.

AFEX was launched in 2014 to develop a warehouse receipt system in partnership with the FMARD. The system enabled smallholder farmers and cooperatives to store their produce safely at approved warehouses, and use receipts as collateral for loans across four states in Nigeria.[26,27] AFEX built on the success of this project to become a commodities exchange platform and also participated in the ABP as an aggregator.[28]

AgroMall also participated in the ABP in 2017 as one of the programme's service providers. Founded in 2016, AgroMall provides farmers with a digital profile, including geo-coordinates of their farmlands, which allows them to access input credit and open a bank account. Using these bank accounts and digital profiles, farmers can receive input loans from participating financial service providers (FSPs) registered under the ABP. Farmers can also receive market-rate payments when selling their crops at aggregation centres, which are paid into their new bank accounts.

While AFEX and AgroMall grew through their engagement with government-led initiatives, other companies and innovators have managed to launch and grow without direct government support. Recent policy[29] has sought to encourage federal, state and local governments to create a stable and healthy investment environment for agricultural development. This has contributed to the emergence of new digital solution providers, such as Farmcrowdy, BeatDrone, Thrive Agric, Crop2Cash and Verdant AgriTech.

24 NANTS (2018), *Factsheet on the Nigerian Agricultural Promotion Policy (APP)*.
25 Ibid.
26 MarketWatch (4 September 2013), *Press release: African Exchange Holdings, Nigerian Ministry of Agriculture Pioneer National Warehousing Project*.
27 The four states that AFEX launched warehouses in are: Kano, Kaduna, Katsina and Zamfara.
28 AFEX: https://afexnigeria.com/about.
29 The Agricultural Promotion Policy (2016–2020) sets out specific roles for federal, state and local governments in order to improve collaboration between different layers of government.

3.2 The challenges to achieving scale

While over 80 agritech companies and start-ups[30] have emerged in Nigeria over the last decade, the majority remain nascent and face barriers to scale. AgroMall, AFEX, Farmcrowdy and Thrive Agric are amongst a few agritech companies to have grown their user numbers within a few years of launch. As of late 2019, AgroMall had onboarded over 500,000 active farmers.[31] Farmcrowdy and Thrive Agric had both acquired over 20,000 farmers each, with Farmcrowdy looking to expand its capacity to 50,000 farmers by the end of 2020.[32]

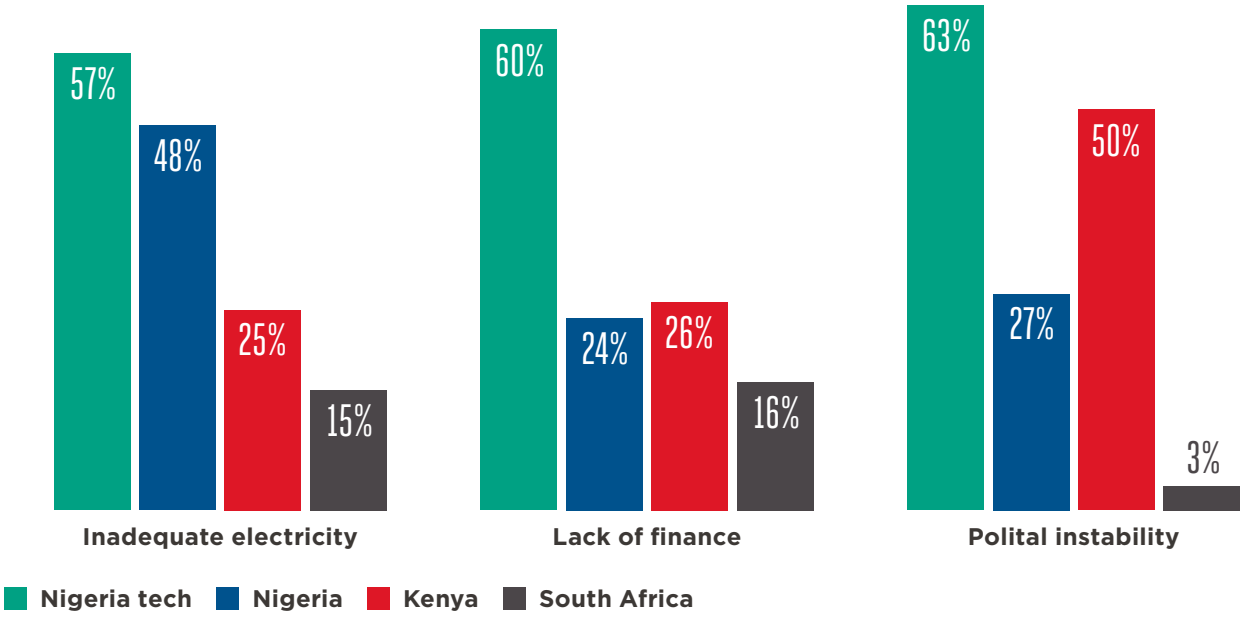
A major barrier to scale is the country's underdeveloped agricultural sector and infrastructure. Nigeria's reliance on oil from the 1970s onward diminished agriculture's potential as a mainstay of the economy. Rising oil revenues not only redirected public investment and attention towards the energy sector, but also led to exchange rate increases that made exports from other sectors uncompetitive. Investment in agriculture subsequently declined.[33] Years of neglect have eroded Nigeria's agricultural ecosystem; once a major cocoa producer on par with Ghana, Nigeria no longer has a cocoa licensing board.[34] To succeed, most agritech start-ups will have to address sectoral and infrastructure gaps in addition to offering digital solutions.

Nigerian companies also struggle with "the basics" of a functional business environment. For instance, businesses constantly deal with frequent power outages, limited access to finance, political instability and insecurity (Figure 8). Although Nigeria is Africa's largest oil producer, the country's power sector is unable to provide adequate electricity for other sectors of the economy and the population. For most companies, running and maintaining diesel generators represents a significant proportion of operational costs. For example, MTN Nigeria spends almost 70 per cent of its operating revenue on generator fuel.[35]

Figure 8

Comparing business "basics" across Nigeria, Kenya and South Africa

To what extent are inadequate electricity, lack of finance and political instability barriers to business activities?



Source:Vijaya Ramachandran et al. (2019), *The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector.* Center for Global Development.

30 GSMA AgriTech analysis
31 An active farmer refers to a farmer approved for input distribution under the Anchor Borrowers' Programme.
32 GSMA AgriTech analysis
33 Cooke, J. and Eigege, J. (2016), *Tracing the Roots of Nigeria's Agricultural Decline*. Center for Strategic & International Studies (CSIS).
34 Odum, F. (13 March 2016), *Scrapping of cocoa board, Nigeria's greatest undoing* — Aikpokpodion. The Guardian, Nigeria.
35 Ramachandran, V. et al. (2019), *The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector*. Center for Global Development.

While sectors such as fintech have managed to attract investment, limited funding opportunities and lack of awareness of funding opportunities can often be the biggest barrier to scale for new ventures, particularly in agritech. In Nigeria, the financial ecosystem required to develop and support new ventures is not mature enough to nurture long-term success.[36] The country's financial infrastructure may struggle to support investments that involve multi-year risk-taking and unproven business models.[37] As a result, start-ups are forced to generate revenue from the onset, rather than focussing on research and development, developing their value proposition and demonstrating a viable business model.

Agritechs can earn revenue from their digital agricultural solutions through two main channels: business-to-consumer (B2C) and business-to-business (B2B). The B2C channel involves charging smallholder farmers directly while in the B2B channel, value chain actors such as agribusinesses and cooperatives are responsible for paying for the solution. Agritech companies can also generate revenue from official institutions through a business-to-government (B2G) channel, and through data monetisation, which involves selling anonymised data to third parties (such as input suppliers and FSPs).

However, generating revenue can be challenging for agritech companies. Research by the GSMA's AgriTech programme has shown that B2B and B2C models are only viable if the solution can resolve well-defined or multiple pain points along the value chain. The B2C model is particularly challenging to implement, especially in Sub-Saharan Africa due to low farmer incomes. Although data monetisation enables farmer and farm data to be used for credit scoring and is a growing revenue opportunity, it needs to be balanced with concerns about farmer consent, privacy, security and liability.

Low skills is another barrier to scale. Without good knowledge of agricultural value chains or technically skilled personnel, start-ups risk producing poorly designed solutions, deterring investors and using existing resources to redesign their solutions. Certain investors, such as impact investors and venture capital firms, expect companies to have well-defined performance indicators in place. For instance, while some agritech companies have onboarded thousands of farmers, few may have metrics on customer value proposition, which are especially sought after by impact investors (e.g. number of farmers generating higher yields).

Agricultural challenges are interconnected, and solving just one of them might not have the desired impact. Many agritech companies therefore offer digital agricultural tools that attempt to solve multiple problems along the agricultural value chain, including providing agronomic advisory, access to input finance and access to buyers. For example, the GSMA mNutrition Initiative found that access to mobile advisory services induced farmers to change their planting, land management, harvest and storage practices.[38] However, when implementing agricultural advisory requires financial investment, farmers face the added challenge of accessing financial services. The absence of an enabling regulatory environment for digital financial services in Nigeria presents a major challenge to both smallholder farmers and other agricultural value chain players who need access to financial services to invest in their businesses.

36 Feng, E. (20 November 2018), *Nigerian tech start-ups proliferate despite hurdles*. Financial Times.
37 Varathan, P. (22 September 2017). *Africa's tech ecosystems can't work like Silicon Valley, and they shouldn't try to*. Quartz Africa.
38 Palmer, T. and Darabian, N. (2017), *Creating scalable, engaging mobile solutions for agriculture: A study of six content services in the mNutrition Initiative portfolio*. GSMA.

3.3 The potential of MNO partnerships to drive scale

Agritech companies can benefit from partnerships or integration with mobile network operators (MNOs) to drive scale and build sustainable business models. For instance, MNO partnership agreements can help agritech companies attract potential investors.[39] Although MNOs in Nigeria are currently not directly involved in the agritech space, some Nigerian start-ups use mobile channels for collecting farmer data or providing content to smallholders. For example, Verdant AgriTech allows farmers with a basic or feature phone to receive agronomic advisory via SMS and interactive voice response (IVR). Thrive Agric provides weather information and agronomic advisory to farmers via SMS.

Despite challenges in deploying mobile money services to improve financial inclusion (see Deep dive: Mobile money regulation in Nigeria), Nigerian agritech start-ups have partnered with FSPs to create fintech solutions geared towards the agricultural sector. For instance, Crop2Cash's partnership with First City Monument Bank (FCMB), a mid-size bank in Nigeria with a focus on agriculture, allows the company to act as a "super-agent" for FCMB and to offer farmers FCMB bank accounts via USSD. Through this arrangement, Crop2Cash offers digital payments to farmers, expanding FCMB's customer base in the process. With new mobile money regulation slowly being implemented, there is a significant opportunity for MNOs and fintech companies to target the agricultural sector.

Partnerships between agritechs and MNOs, FSPs or fintech companies offering mobile money services have the potential to improve the business models of agritech companies. MNOs have several assets to offer the agritech sector, including distribution capacity, network coverage, customer relationships and brand recognition. MNOs can also benefit from such partnerships through increased mobile money use. For example, MTN Ghana launched mAgric, a mobile-based service that digitises smallholder farmer records and agribusiness-to-farmer payments via MTN MoMo (MTN Ghana's mobile money service). Early results indicate that farmers who pay for their crops via mobile money are likely to continue using the service for other transactions, such as peer-to-peer transfers, merchant payments and remittances.[40]

DEEP DIVE
Mobile money regulation in Nigeria

Until 2018, MNOs were not allowed to offer mobile money services in Nigeria. Mobile money services could only be offered by banks and specialist non-bank mobile money operators.[41] With around 60 per cent of the population unbanked, uptake and awareness of mobile money amongst the population is very low. Barely one per cent of the population uses mobile money, while only 16 per cent of Nigerians are aware of the service.[42]

In 2018, the CBN issued "Guidelines for Licensing and Regulation of Payment Service Banks". Building on the failure of an earlier financial inclusion regulatory framework, this new regulation allows MNOs to apply for a licence to become payment service banks (PSBs).[43] A PSB is a new type of bank run on a smaller scale than a traditional bank, and does not have credit risk or foreign exchange operations.[44] PSBs can offer accounts (current and savings), payments and remittance services, debit and prepaid cards and ATMs. This regulatory framework is similar to India where PSBs have been in operation since 2017.[45]

While all major Nigerian MNOs have applied for PSB licences, only Glo and 9Mobile have been awarded an agreement in principle (AIP) as of March 2020.[46] An AIP is a precursor to applying for a full PSB licence. The CBN awarded a "super-agent" licence to MTN in 2019, which allows customers to send and receive money through agents, while Airtel is awaiting its AIP. To ensure the commercial success of mobile money and to facilitate financial inclusion, government support should continue beyond regulatory reforms by promoting customer education, particularly amongst rural Nigerians, and creating and maintaining agent networks in rural areas.

39 In Kenya, M-Tiba, a Safaricom-backed mobile healthcare wallet that allows users to save money for future health emergencies, received around $1.5 million from Agence Française de Développement (AFD). This investment will enable M-Tiba to increase the number of healthcare providers on its platform while extending their rural and offline reach.
40 Tricarico, D. (2019), *Learning first-hand how farmers experience last mile digitisation: Ghana Field Focus Week lessons, part one*. GSMA.
41 The CBN's Guidelines on Mobile Money Services defined non-bank led mobile money operators as: "A corporate organization that has been duly licensed by the CBN to deliver mobile money services to customers. The Lead Initiator shall be a corporate organization (other than a deposit money bank or a telecommunication company) specifically licensed by the CBN to provide mobile money services in Nigeria."
42 Saigal, K. (2019), *Regulators give mobile money in Nigeria a boost*. Euromoney.
43 Bahia, K. and Muthiora, B. (2019), *The Mobile Money Regulatory Index*. GSMA.
44 Sustainable and Inclusive DFS (15 October 2018), *Payment Banks: All You Need to Know about Nigeria's Newest Payment Service Category*. Medium.com.
45 Chadha, S. (2020), *A regulatory model assessment of Payments Banks in India: The story of a glass half full, yet half empty*. GSMA.
46 Kazeem, Y. (10 October 2019), *Nigeria is finally turning to telcos to drive financial inclusion through mobile money*. Quartz Africa.

4 AgriTech investment

4.1 Types of agritech funders and investments

There are a range of funders in the Nigerian agritech space, including early-stage funders such as incubators, accelerators, angel investors and donors, and mid-stage investors such as impact investors and venture capital firms (Figure 9). Late-stage investors, such as private equity firms and corporate investors, are currently inactive in the agritech space as they tend to invest larger amounts in established start-ups (across all sectors) with a proven business model and a history of generating profit.

Figure 9

Examples of start-up funders in Nigeria

Funder	Definition	Examples of investors active in Nigerian agritech
Accelerator	Accelerators support early-stage, growth driven start-ups through education, mentorship and financing. Start-ups typically enter accelerators for a fixed period of time and as part of a cohort of companies.	Ventures Platform, Itanna Accelerator
Angel investor	Angel investors can either be an individual or group of individuals who use their personal money to finance companies. Angel investors can often be a founders' friends and family.	Rasheed Olaluwa, Tomi Davies
Corporate investor	Corporate investors invest strategically, such as buying a company to access its proprietary technology. They are similar to venture capital firms and are often referred to as corporate venture capital.	
DFI	Development finance institutions (DFIs) are specialised, government-owned organisations that invest in private sector projects in low- and middle-income countries to promote job creation and economic growth.	FMO
Donor	Refers to a company, individual or government agency that provides capital to a start-up or company without typically taking an equity stake in the company.	Tony Elumelu Foundation, GIZ, UK aid, Australian Aid
Impact investor	Impact investors aim to generate specific beneficial environmental or social effects in addition to financial gains.	GreenTec Capital Partners

Incubator	An incubator is a company that helps start-ups during the early stage to develop from ideation to product or service development. Incubators typically provide desk space, mentorship and other business advice.	Passion Incubator, Wennovation Hub
Private equity	Private equity firms source investment capital from high net-worth individuals and firms and typically invest in companies during the later stages of growth in order to take control of them.	Ajayi Solutions, Cox Enterprises
Venture capital	Venture capital firms invest in companies, typically those with long-term potential, using funds raised from pension funds, endowment and wealthy individuals.	Consonance Investment Managers, Timon Capital

Source: Crunchbase, Investopedia and the GSMA AgriTech programme

Start-ups typically begin their funding journey by joining an incubator, a company that offers office space and provides business advice. Some incubators also provide capital to their best performing start-ups. While there is no defined trajectory, a possible next step for a start-up is to join an accelerator. Accelerators provide an intense, rapid and immersive capacity building experience on business management principles and skills. Many Nigerian agritech start-ups have been supported by local incubators, such as Passion Incubator, Wennovation and CC Hub. A small number also enrolled in international accelerator programmes (Figure 10). Both Thrive Agric and Farmcrowdy received investment and support from US-based Y Combinator and Techstars, respectively.

A potential next step would be to seek investment from angel investors or international donors. Angel investors are common in Nigeria and often provide early-stage funding even from the onset, before a start-up joins an incubator or accelerator programme. International donors providing concessional finance, such as GIZ, UK aid and USAID, are also active in the agritech space in Nigeria. Concessional finance refers to finance that does not seek a market return,[47] such as grants, competition prizes or funding for specific projects. Concessional funds can be pioneering in nature and are usually provided to build capacity, to demonstrate success by testing a service or proof of concept and to crowd in other investors.

Figure 10

Early stage agritech funders in Nigeria

Agritech	Incubator	Accelerator	Angel Investor	Donor*	Venture capital	Other
AFEX				UK aid	Consonance Investment	
AgoMall						Bank loan
Beatdrone	Passion Incubator		Audo Maikori et al			
Crop2Cash	Wennovation Hub			GIZ CARI		FCMB
Farmcrowdy		Techstars	Rasheed Olaoluwa	UK aid, Australian Aid	Cox Enterprises et al	
Hello Tractor				USAID		
ThriveAgric	Ventures Platform	Y Combinator	Unnamed group			
TradeBuza	Passion Incubator	Itanna				
Verdant AgriTech				EU, Katsina State		

*** A number of companies have received donor funding through implementation organisations, such as AGRA, GSMA and the West Africa Food Markets programme. This table lists the original donor rather than the implementation organisation. Source: GSMA AgriTech programme**

47 Shaw, M., Obanubi, M. and Tyler, G. (2019), *Development Finance: How it can enable the growth and transformation of agriculture*. Gatsby Africa.

To scale further after early-stage funding, agritech companies need to target higher ticket investments from impact investors or venture capital firms. Impact investors are investment management companies that invest capital to derive positive social outcomes. Impact investors can be either venture capital firms or philanthropic investors and typically provide patient capital. Unlike traditional investment from profit-focused venture capital or private equity firms, patient capital can be invested and recouped over a longer time frame.

While impact investors target financial gains, they also prioritise social impact as a specific outcome. Acumen, GreenTec Capital Partners and Palladium are examples of international impact investors active in Nigeria. However, with the exception of GreenTec Capital Partners investing in Farmcrowdy at the early stage (see Figure 11 for an explanation of funding stages), few other impact investors are currently active in Nigerian agritech.

Figure 11

Start-up funding stages

Funding stage	Definition	Average ticket sizes*	Growth stage
Pre-seed	Pre-seed refers to the period during which a company's founders are getting their operations off the ground, typically funding the company themselves or with help from family, friends and supporters.	$50K–150K	EARLY
Seed	Seed funding represents the first official money that a company raises, helping it to finance market research and product development, employ a founding team and determine its target demographic.	$150K–500K	GROWTH
Series A	In Series A funding, investors look out for companies with great ideas and a strong strategy for turning ideas into a successful, money-making business.	$500K–2m	EXPANSION
Series B	Series B rounds involve taking businesses to the next level, past the development stage, by expanding market reach.	$2m–10m	
Series C	Companies at Series C funding rounds are already quite successful, and would seek additional funding in order to help them develop new products, expand into new markets, or acquire other companies.	$10m+	

* Average intestment ticket size ragnes across Sub-Sahran Africa. Source: Blaauboer, E., (2019). What's The Right Round Size For Your Stage (Weetracker)
Source: Investopedia and Crunchbase

Two main reasons for the lack of impact investment in Nigerian agritech are the low appetite for sub-commercial returns in the agriculture sector and the small deals typically on offer.[48] Given that investors can typically demand returns of 15 to 18 per cent, most impact investment flows in Nigeria in 2019 went to companies in other sectors, such as fintech and energy.[49] Overall, impact investment remains a relatively new concept in Nigeria, with start-up investment driven mainly by financial returns.

Venture capital firms can invest from the early stage, but are more likely to invest in later rounds once start-ups are commercially viable. For example, in 2017, Farmcrowdy received $1 million in the seed round from a consortium including angel investors and foreign-owned venture capital: Social Capital and Hallett Capital.

Private equity firms, development finance institutions (DFIs) and corporate firms are likely to invest once a company has a history of profitability. While private equity firms and DFIs target commercial returns, a corporate investor would seek to either take a controlling stake or take over a start-up entirely to use its proprietary technology for its own operations. Private equity firms, DFIs and corporate investors are likely to invest higher ticket sizes from Series A onwards. As most Nigerian agritech companies are raising money at the pre-seed and seed levels, DFIs, private equity firms or corporate investors are currently not actively investing in Nigerian agritech.

48 Palladium (October 2015). *Palladium Impact Investing: Nigeria Trip Review*.
49 Source: Crunchbase and Digest Africa

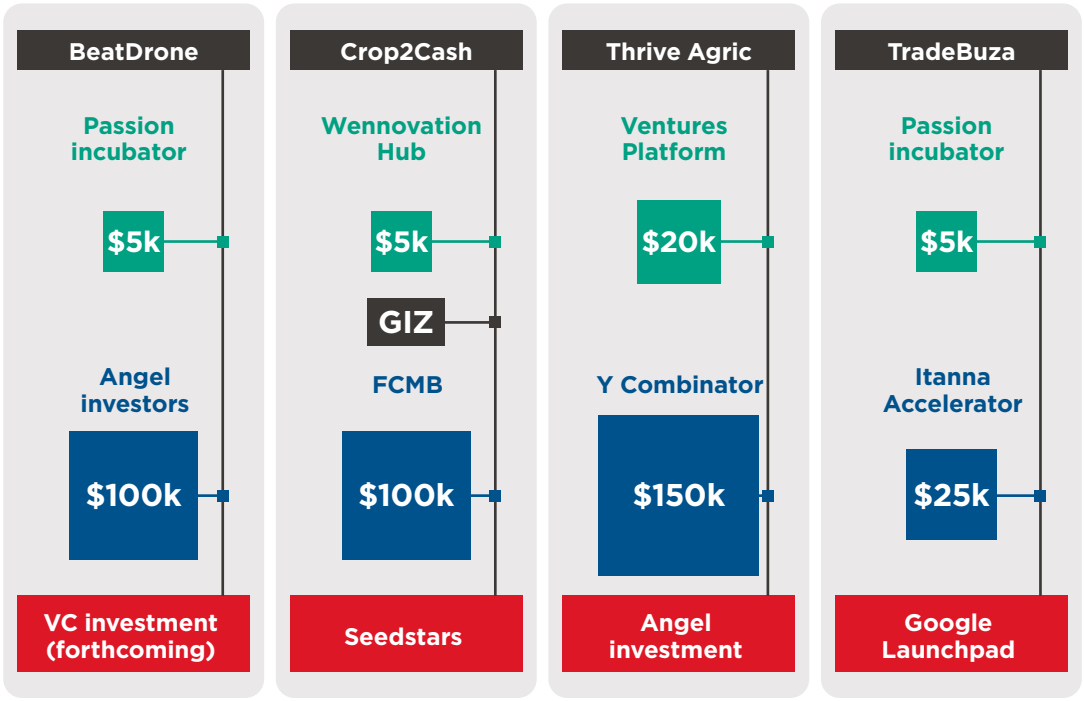
DEEP DIVE

The role of incubators in crowding in investment

Incubators and accelerators can make a significant difference in a start-up's journey. Early investment through local incubators has helped generate confidence in the agritech sector and attract additional investors (Figure 12), boosting the credibility of investees in the wider investment community. The examples of BeatDrone, Crop2Cash, Thrive Agric and TradeBuza show how initial investment, investor reputation and support have enabled the subsequent crowding in of investors and the ability to attract talent.

Figure 12

Early and subsequent investors in selected Nigerian agritech start-ups



Source: GSMA AgriTech

For example, Thrive Agric boosted its credibility in the business community after being selected for Y Combinator's accelerator programme, whose alumni include companies such as Airbnb, Uber and Stripe. As a result, Thrive Agric was able to recruit high-calibre staff, including senior developers, business and operations leaders and a dedicated finance team.

Passion Incubator provided programmatic and financial support for both BeatDrone and TradeBuza from the onset, and used its network to introduce both to potential investors. This early support allowed TradeBuza to raise awareness of its value proposition and ultimately to join Itanna Accelerator. Itanna's support and subsequent validation helped TradeBuza land a spot on the 2019 Google Launchpad accelerator programme.[50] The programme offers start-ups access to Google engineers and mentoring from other Google teams, experts and mentors from Silicon Valley, public relations training and global media opportunities, and a close partnership with Google for three months, all equity-free.[51]

50 Ventureburn, (2019), *Here are the 12 start-ups selected for Google Launchpad Africa's fourth class.*
51 Google Developers: *https://developers.google.com/*.

4.2 The role of donors and grant funding in agritech

Concessional finance delivered through grant funding, as a form of restricted funding for a specific programme of activity, has played an important role in providing early-stage funding in Nigerian agritech. Crop2Cash, Hello Tractor and Verdant AgriTech have benefitted from concessional finance provided by donors to test their solutions or initially subsidise the cost of providing the solutions to farmers. Established companies, such as AFEX, have also received grant funding to conduct successful pilot projects.

A key consideration in the success of donor-funded initiatives is ensuring the objectives of the agritech company and donors are aligned. For example, in 2018, Farmcrowdy received a $325,000 grant from UK aid and Australian Aid via the GSMA Ecosystem Accelerator programme. The grant was awarded to develop a mobile app for farmers to receive information, training and digital payments, and to communicate with sponsors.[52] In this case, the donors sought to demonstrate the impact of innovative mobile-based services while Farmcrowdy was able to expand and improve its digital platform.

While ensuring objectives are in alignment is a key requirement for successful donor partnerships, building a viable business out of grant funding is a challenge across Sub-Saharan Africa. The fundraising success of many start-ups has led to the emergence of "grantpreneurs", or start-up founders who excel at securing grant funding, but are unable to build a successful business out of grants.[53]

Donor funding nonetheless has strong potential to attract investors by increasing visibility and interest in new models. To secure additional investment on the back of donor funding, start-ups will need to demonstrate success through a pilot or proof of concept. However, the Nigerian agritech landscape demonstrates that a strong track record in securing grant funding is often not enough to attract commercial investors.

An example of a successful transition from donor funding to commercial investment is Crop2Cash's partnership with FCMB. Crop2Cash initially worked with Deutsche Gesellschaft für Internationale Zusammenarbeit (German Corporation for International Cooperation or GIZ) through their Competitive African Rice Initiative (CARI) on a pilot to digitise procurement and payments to smallholder farmers in the last mile of the rice value chain in Northern Nigeria. Following this, the company won a pitching competition sponsored by Wennovation Hub (its incubator) and FCMB. Crop2Cash's prizes were a $100,000 investment from FCMB and the ability to use FCMB's banking licence to develop a digital payments solution for farmers.

Agritech companies may prefer to prioritise funding opportunities from commercial investors over prescriptive donor funding. This view is supported by a European Commission review, which found that high-growth potential companies that receive impact investment in the form of equity are likely to see higher turnover. However, to encourage crowding in, investment should be complemented by incentives for private sector investment.[54] For instance, the Nigerian government could increase investment flows by incentivising angel investors to support agritechs or introducing tax breaks for early-stage investors.

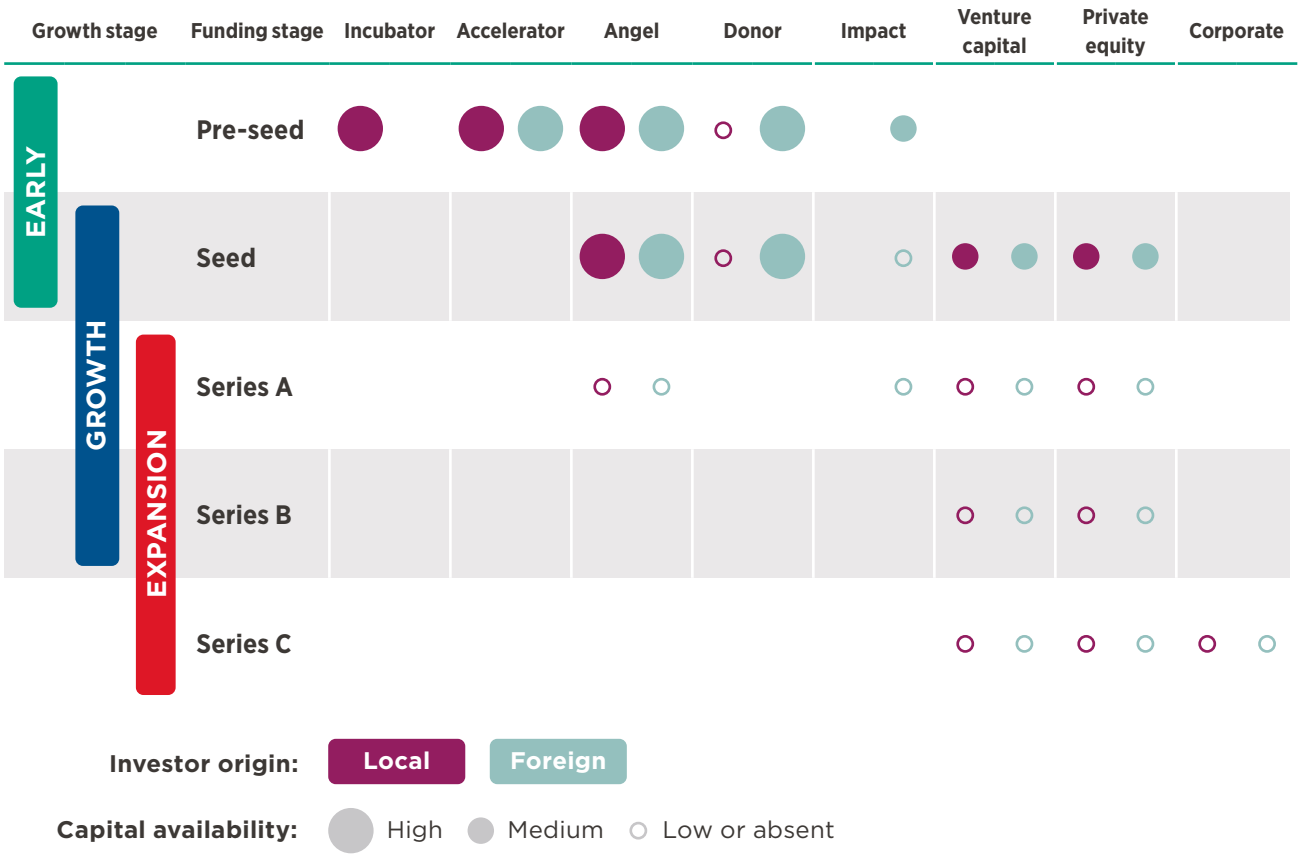
52 GSMA Ecosystem Accelerator Innovation Fund (2018), *Start-up Portfolio*.
53 Varathan, P. (22 September 2017). *Africa's tech ecosystems can't work like Silicon Valley, and they shouldn't try to*. Quartz Africa.
54 Ramachandran, V. et al. (2019), *The New Economy of Africa: Opportunities for Nigeria's Emerging Technology Sector*. Center for Global Development.

5 The agritech funding gap

Venture capital firms invested about $747 million in Nigeria in 2019, with 62 per cent of investments going to fintech companies.[55] In contrast, Nigerian agritech start-ups barely raised $2 million in the same year.[56]

Figure 13

Agritech funders active during funding rounds in Nigeria



Source: GSMA AgriTech programme

55 Partech Partners (2020), *2019 Africa Tech Venture Capital Report*.
56 GSMA AgriTech analysis.

A major reason for the lack of investment in agritech in Nigeria is the high perceived risk of agriculture as a business and low expectations of the potential return on investment. While investment is available at the early funding stages (Figure 13), subsequent finance is not easily available to agritech start-ups after the seed stage. This creates funding gaps for start-ups to overcome.

Nigerian agritechs face three types of funding gaps:

- Limited sources of local capital beyond the pre-seed stage;
- Low availability of institutional investors; and
- An inability to attract big-ticket investments.

5.1 Limited sources of local capital beyond pre-seed stage

While local investors, such as incubators, accelerators and angel investors, are actively investing at the early stage, local capital is not readily available after the pre-seed stage. Some local investors, such as angel investors and venture capital firms, are more likely to invest in an agritech start-up that has already benefitted from foreign investment. Foreign capital, which is likely to include a thorough due diligence process, is used by some local investors as a sign of trust and knowledge in the local market, especially given that local investors may not have much experience working in the agritech space. For instance, Thrive Agric and Crop2Cash both received local investment only after securing foreign funding at the early stages. Foreign capital validated the viability of crowdfunding platforms, a novel use case in Nigeria, making it more attractive to local investors.

Some Nigerian agritech start-ups focus on raising funds primarily from foreign sources. For instance, Farmcrowdy concentrates entirely on foreign funding opportunities. Foreign investors with a history of active involvement in agritech are more likely to take on the risks associated with investing in the sector. Foreign investors may also be able to raise capital at a lower cost than Nigerian investors. The cost of capital for local investors can range from 20 to 30 per cent in interest. With low returns that can take time to recoup, it is common for investors in Nigeria to focus on investment opportunities in sectors such as oil and gas, where investment yields are higher and returns are quicker.

Lending to the agricultural sector accounts for only 3.4 per cent of all bank lending in Nigeria (as of 2019).[57] Despite pressure from the CBN, most banks are reluctant to lend to the agricultural sector, including to agritech companies that provide services to smallholder farmers. Commercial banks are more likely to work with well-established and large agribusinesses with a record of profit.[58]

Banks also face regulatory limitations on the duration of loans and the types of risk that they can take on.[59] Without understanding how agritech can improve agriculture, and without reliable market data, banks have limited ability to assess the risk of lending to agritech start-ups. While some banks may be willing to lend, agritech start-ups tend to avoid bank loans due to interest rates as high as 30 per cent or collateral demands that are difficult to meet for a typically small and nascent company.[60]

57 Shaw, M., Obanubi, M. and Tyler, G. (2019), Development Finance: How it can enable the growth and transformation of agriculture. Gatsby Africa.
58 Palladium (October 2015). *Palladium Impact Investing: Nigeria Trip Review*.
59 Shaw, M., Obanubi, M. and Tyler, G. (2019), Development Finance: How it can enable the growth and transformation of agriculture. Gatsby Africa.
60 Ibid.

5.2 Low availability of institutional investors

Beyond the pre-seed and seed funding stages, there is an absence of institutional investors, such as impact investors, venture capitalists, private equity firms and DFIs. Although impact investors, such as Acumen, GreenTec Capital Partners and Palladium, are actively investing in several sectors in Nigeria, the agritech sector is still considered risky. This concern is not limited to Nigeria. In 2018, only six per cent of impact investors' assets under management covered the food and agriculture sector.[61] So far, global impact funds with a purely agricultural mandate have failed to preserve capital or meet their investors' return objectives, despite being structured over a five-year period.[62]

Venture capital and private equity firms are also largely absent, as are DFIs, such as CDC and KFW. Historically known for providing concessional finance to pioneering sectors, only FMO, a DFI backed by the Dutch government, is an exception, investing $4 million in agritech Babban Gona in 2017. Established in 2012, Babban Gona provides around 21,000 farmers (as of 2019) with a range of end-to-end services, such as access to credit and inputs, agronomic advisory and training, crop insurance, access to storage facilities and access to market. Babban Gona achieved a positive EBITDA margin in 2015 and a positive net income in 2016, proving the sustainability of its business model to potential investors and managing to attract debt and equity funding.

Over the last two decades, the role of DFIs has changed. Previously tasked with building capability, demonstrating success and crowding in other investors, DFIs now avoid early-stage ventures and play a similar role as venture capital or private equity firms. All three prefer to invest big ticket sizes from Series A onward in ventures with a track record of profitability.[63] Rather than crowding in private sector investment in pioneering sectors, DFIs now require private investors to provide pioneering finance before investing in de-risked ventures. Given their transaction sizes and the transaction costs involved, DFIs generally focus on big-ticket investments in agriculture. Nigerian agritech does not offer large commercial opportunities that would justify DFI investment.

61 Global Impact Investing Network (GIIN) (2018), *Annual Impact Investor Survey*.
62 Shaw, M., Obanubi, M. and Tyler, G. (2019), *Development Finance: How it can enable the growth and transformation of agriculture*. Gatsby Africa.
63 Ibid.

CASE STUDY

How local investment helped Farmcrowdy attract foreign investment

The experience of Farmcrowdy demonstrates how early local investment can be important in setting up a start-up for additional investment from foreign investors (Figure 14). Initial investment came from a local angel investor and private equity firm, enabling the company to launch operations and enrol in the US-based Techstars accelerator in 2017.[64] Techstars exposed Farmcrowdy to a range of international venture capital and private equity investors, leading to the company's first seed investment of $1 million from a consortium of foreign investors. Farmcrowdy used this funding to scale operations and increase the number of farmers and crowdfunding investors on its platform.

Figure 14

Farmcrowdy's investment history

Round	Date	Investment value	Angel	Private equity	Accelerator	Venture capital	Donor	Investors
Pre-seed	August 2017	$100,000	■	■				Rasheed Olaoluwa, Right Side Capital Management
	December 2017	$1 million		■	■	■		Tyler Scriven, Techstars Atlanta, Cox Enterprises, Social Capital, Hallett Capital, Josephine Group et al
Seed	February 2018	$325,000					■	UK aid, Australian Aid
	March 2019	$1 million		■				Cox Enterprises, Techstars, Ajayi Solutions

Source: Crunchbase, Digest Africa and the GSMA AgriTech programme

The company also used this funding to attract additional investment from UK aid and Australian Aid to develop a mobile app (see section 4.2). This enhanced Farmcrowdy's standing amongst some of its earlier investors, such as Cox Enterprises and Techstars, which invested another $1 million in additional seed funding. Farmcrowdy stands out as one of the few agritech start-ups that has raised money from a range of investors (Figure 18), both local and foreign, at the pre-seed and seed stages.

Farmcrowdy's online platform allows the public to invest in smallholder farms, with the expected rate of return and time frame clearly stated for each farm type. The company has around 115,000 sponsors and 25,000 farmers on its platform.[65] Farmers registered on Farmcrowdy's platform are provided with inputs, fertiliser and agronomic advisory, while crop buyers and prices are determined before a farmer is registered on the platform. At the end of a harvest, Farmcrowdy retains 20 per cent of the profits generated from the sale of crops, with the remainder shared between farm sponsors and farmers. Sponsors' initial capital is also reimbursed.

64 Jackson, T. (4 August 2017), *Nigeria's Farmcrowdy joins Techstars Atlanta accelerator*. Disrupt Africa.
65 Farmcrowdy.com and impakter.com/farmcrowdy/.

5.3 Challenges in attracting large ticket investments

Limited local funding sources beyond the early stage and the low availability of institutional investors have resulted in lower ticket size investments in agritech than in other industries in Nigeria. Ticket sizes invested in Nigerian agritech between 2015 and 2019 ranged from $4,000 to $1 million at the pre-seed and seed stages (Figure 15).[66] Compared to other sectors that received investment in 2019, the average investment ticket size at the pre-seed and seed stages was $12.3 million in 2019, primarily due to large investments in fintech.[67] For example, PalmPay, a fintech, received $40 million in seed investment.[68]

Figure 15

Investment ranges and average ticket sizes in Nigerian agritech[69]

Funding stage	Agritech in Nigeria		Other sectors*
	Range	Average ticket size	Average ticket size
Pre-seed	$4,000–$100,000	$65,000	$381,000
Seed	$5000–$1 million	$262,000	$9,600,000**
Grant (not specifically stated as pre-seed or seed)	$14,000–$4 million	$618,000	N/A

*** Sectors included: e-commerce, education, fintech, healthcare and logistics.**
**** This figure is significantly impacted by the $40 million invested in PalmPay. Excluding this figure, the average seend investment in Nigera in 2019 was $2 million**

The perceived risks of investing in agritech has resulted in limited funding beyond the early stage, leading to low ticket sizes for investment. This, in turn, can cause agritechs to struggle to attract institutional investors at later stages, who typically look for higher-value investment opportunities, and may limit other opportunities to attract more investment.

66 Crunchbase, Digest Africa, GSMA AgriTech programme
67 Crunchbase, Digest Africa, Maxime Bayen, Dario Giuliani, GSMA AgriTech programme
68 Bright, J. (13 November 2019), *PalmPay launches in Nigeria on $40M round led by China's Transsion*.
69 GSMA AgriTech programme

6 Matching the investment criteria of investors and agritechs

Key considerations for investors when selecting companies for investment include the quality of the management team, knowledge of agricultural value chains, expected revenues and costs and company's overall readiness for investment.

When selecting companies to invest in, key considerations include the quality of the management team, knowledge of agricultural value chains, expected revenues and costs and the company's overall readiness for investment (Figure 16). A company that is investment-ready should already have a proven business model and demonstrable impact. Most start-ups and companies that have struggled to attract investment will have encountered a challenge with one or more of these selection criteria. To overcome this, some investors use intermediaries to prepare start-ups for their investment. For example, GreenTec Capital Partners uses Funema, a local venture capital company, to ensure that a start-up's vision, goals and operations are aligned with its own expectations before investing in them.

Agritech start-ups and companies in Nigeria must overcome the challenge of convincing largely risk-averse investors unfamiliar with agritech to provide support over a period of five years or more (Figure 17). Investor scepticism stems from associating agritech with agriculture, with the latter seen as a traditional and unprofitable short-term investment.

Investors who are familiar with the agritech sector are likely to invest in companies that offer solutions that resolve multiple pain points for smallholder farmers or in the agricultural value chain. However, most agritech start-ups in Nigeria are still nascent and have yet to establish a proven business model, even though many offer end-to-end digital agricultural solutions.

Figure 16

Investors' criteria and common pitfalls for agritech companies

Investors' criteria	Common pitfalls investors have encountered with companies
Is the leadership team appropriately skilled and complementary in nature?	The company's founders have a good idea, but do not have the right resources to execute their plan – without significant change.
Does the company's staff have knowledge of or experience with agricultural value chains?	The company is attempting to use technology to solve an agricultural problem without a detailed understanding of the problem.
Does the company understand its economics (the costs and revenues associated per user)?	The company has projected high rates of growth on the basis of a short pilot without understanding the longer term cost savings and benefits.
Is the company structured appropriately and ready to work with us?	The company is not set up properly as a business, therefore limiting its ability to use investment effectively without significant support.

Source: GSMA AgriTech programme

Figure 17

Start-ups' criteria and common pitfalls encountered by investors

Start-ups' criteria	Common pitfalls companies have encountered with investors
Does the investor understand the benefits of my digital agricultural solution?	The investors have limited experience investing in new technology, especially agriculture.
Would the investor be willing to invest over a period of fiver years?	The investors are looking for risk-adjusted returns over a shorter period, similar to what might be on offer in other industries.
Can the investor provide mentorship or introduce me to other possible investors?	The investor could change my business significantly and may not be able to open their network to me.

Source: GSMA AgriTech programme

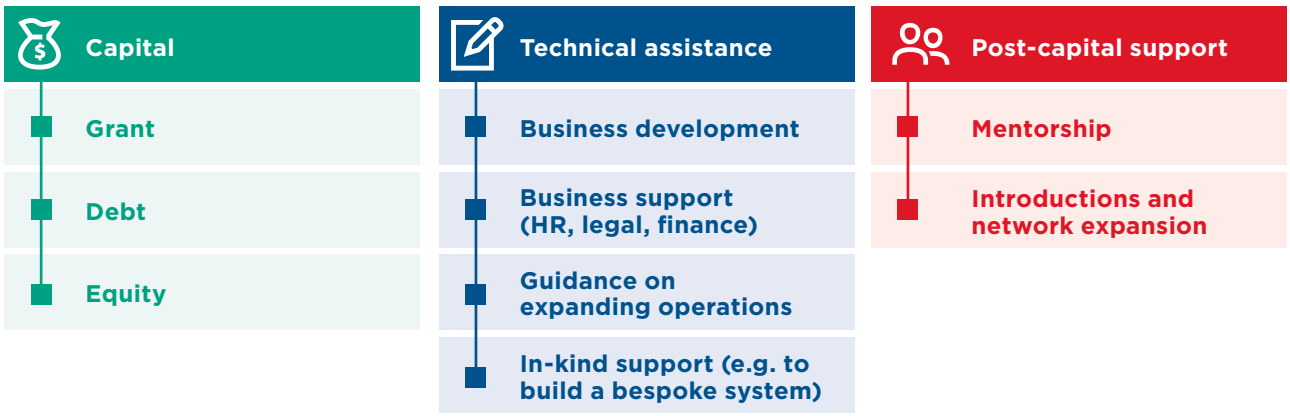
Agritech companies also seek non-capital support, such as technical assistance and mentorship (Figure 18). Technical assistance includes advice and techniques on how to enhance the digital solution and improve market access and operational efficiency. Mentorship refers to critical business guidance by a mentor or coach, typically someone with a track record in business. Mentorship allows start-ups to pick up new ideas, test their thinking and learn from past mistakes. Mentors can also unlock additional networking opportunities for start-ups, which could lead to partnerships or investment.

Nigerian agritech companies highly value technical assistance and mentorship in crowding in additional investment, especially if the technical advisors and mentors have a good understanding of the agricultural sector. Given the challenges they face, Nigerian agritechs can benefit from investors' experience in devising a growth strategy, hiring the right talent to achieve scale and building internal capacity to run a business efficiently.

Since agritech companies often encounter investors that are unfamiliar with their sector, engagement between investors and companies is more likely to be fruitful if approached diligently by both sides. Start-ups and companies that understand an investor's investment history and criteria will be well placed to secure investment. Investors may need to fully understand the agricultural value chains involved, the pain points the solution is trying to address as well as key gaps in the start-ups before being able to provide support and funding.

Figure 18

Types of investment and support available to agritech start-ups



Source: GSMA AgriTech programme

7 Lessons

Donors still play a key role in stimulating agritech innovation, by offering grants that position start-ups for further growth.

In Nigeria, donor funding has been important in supporting agritech companies to demonstrate social impact for underserved or financially excluded communities. Donors have primarily offered grants for pilots or specific components of existing projects, but many agritech start-ups have struggled to find follow-up finance to grow out of the pilot stage.

At the same time, agritech companies risk relying too heavily on grant funding beyond early funding stages, which can be detrimental to building a commercially driven agritech community. It is vital that donors structure their funding opportunities to help start-ups develop into sustainable businesses.

Incubators and accelerators have helped early-stage companies progress from ideation to the pilot stage and to secure initial investment.

BeatDrone, Crop2Cash, Thrive Agric and TradeBuza all benefitted from being part of an incubator or accelerator programme. Each company received business advice and small investments to improve and pilot their respective digital solutions. This support boosted their credibility within the investor community and subsequently led to larger additional investment. Joining an incubator or accelerator programme can help early-stage agritech companies in Nigeria improve their business acumen and test their solutions, and use this experience to attract additional investment.

There is an opportunity for local and foreign investors to influence the agritech sector from the early stages, but this may require patient capital investments.

Several investors, particularly institutional ones, are active in a range of sectors in Nigeria. Impact investors would typically invest at the seed stage and Series A level, as some of the capital they raise is philanthropic. However, they have been reluctant to invest in agritech due to the high perceived risk of investing in the agricultural sector and the low returns and ticket sizes on offer. Impact investors may also consider investments based on a clear exit strategy, however, Nigerian agritech does not have a history of successful investor entries and exits.

Local investors often provide early-stage capital given their understanding of the local business context. However, these investments are usually small and show little potential to attract additional investment. There is a role for local investors to expand into offering initial growth-focused funding. If such investments include patient capital, they are more likely to attract interest from other investors, both local and foreign.

To attract continuous investment, agritech companies should focus on bringing a strong value proposition to market that offers an end-to-end solution and a clear revenue model.

While many agritech companies have developed innovative digital agricultural solutions, some of these services struggle to attract investment because they are not deemed “fit for market” or are not “sticky” enough for farmers to use repeatedly. To attract investment, digital agricultural solutions should solve a

range of pain points in agricultural value chains rather than one specific problem. For instance, improving farmers' access to inputs and finance is not enough on its own. Farmers are more likely to make the best use of seeds and credit if inputs are supplemented with regular agricultural advisory and access to market, both of which digital agricultural solutions can provide. Such end-to-end digital solutions, which can demonstrate improved farming practises, higher yields, lower costs and better access to market, are more likely to attract the attention of investors, including major agricultural processors and even international buyers.

Agritech companies should also have a realistic approach to revenue generation. For instance, digital agricultural solutions that require farmers to pay user fees from the onset are less likely to scale rapidly, limiting their investment potential. Investors are more likely to work with agritech companies with a clear revenue model and a value proposition that addresses multiple pain points along a value chain.

Agritech companies should patiently engage with investors to further explain the benefits of their digital solution and related business opportunities, while investors may need to think of alternative models for agritech investments.

Many investors are likely to associate agritech investment with the risks in the agricultural sector at large. As a result, there is a need for greater awareness amongst investors of the benefits that technology can bring to the agricultural sector. Agritech companies should aim to educate investors about their unique business proposition and the agritech sector in general, before demonstrating the opportunity for both sides to benefit from investment. Such engagement may take time and should be approached patiently. Investors willing to invest smaller ticket sizes should also come up with innovative financial models, such as using donor capital as a first-risk guarantee and blended finance comprised of part debt and part equity, to overcome the risks of investing in agritech.

To enable agritech start-ups to boost the agricultural sector, the Nigerian government should widen its support beyond increasing liquidity to creating an enabling environment for innovation and improving existing infrastructure.

Although the Nigerian government has increased the amount of loan funding available to the agricultural sector as a whole, more effort is needed to boost innovation and the use of technology in agriculture. In Nigeria, buy-in from different governmental levels is important for agritech start-ups to pilot, launch and grow their services. While some government support is available at the state or local levels, additional government intervention may help to increase investment in Nigerian agritech. For instance, providing tax exemptions for early-stage investments could incentivise additional local investment in agritech and tech as a whole.

Government support should extend beyond specific agriculture-related or agritech-related policies. For instance, many agritech companies in Nigeria are keen to provide farmers and their crop buyers with a digital payments solution. However, the current regulatory framework has hindered the growth of mobile money, which is well placed to offer financial services to rural or financially excluded communities.

In addition to revamping the country's financial and digital infrastructure, improving the country's physical infrastructure can especially benefit the agricultural and agritech sectors. Many agritech companies have to invest in logistics (i.e. warehousing, transportation) to provide services to farmers, including access to markets. Infrastructural upgrades will mean a reduction in the cost of moving goods around, improving start-ups' margins and revenue. This transformation, which will be critical to improve the ease of doing business in Nigeria, has significant potential to attract investment to the agritech sector.

Appendix

Figure 19

Types of funders defined[70]

Funder	Definition
Accelerator	Start-up accelerators support early-stage, growth-driven companies through education, mentorship and financing. Start-ups enter accelerators for a fixed period and as part of a cohort of companies. Accelerator programmes provide an intense, rapid and immersive business education to young innovative companies in the space of a few months.
Angel investor	Angel investors can either be an individual or group of individuals who use their personal money to finance start-ups. Angel investors are most likely to be a founders' friends and family members. Angel investors are often ex-entrepreneurs, business leaders or wealthy individuals.
Corporate / strategic investor	Corporate or strategic investors invest strategically, such as buying a company to access its proprietary technology. They are similar to venture capital firms and are often referred to as corporate venture capital.
Development finance institution	Development finance institutions (DFIs) are specialised development organisations usually owned by national governments. DFIs typically invest in private sector projects in low- and middle-income countries to promote job creation and sustainable economic growth.
Donor	A donor refers to a company, individual or government agency that provides capital to a company without typically taking an equity stake in the company.
Impact investor	Impact investors can be similar to private equity or venture capital firms, but aim to generate specific beneficial social or environmental effects in addition to financial gains. The point of impact investing is to use money and investment capital for positive social results.
Incubator	An incubator is an investment company that helps new and upcoming start-ups develop from ideation to product or service development. Incubators typically provide desk space, mentorship and other business services (such as legal, human resources and financial advice) in exchange for a small proportion of the start-up's equity. Some incubators also provide small amounts of start-up capital.
Peer-to-peer lender	Peer-to-peer lenders are individuals or groups that offer funding to small business owners. These can include individuals, lending groups and crowdfunding platforms. Peer-to-peer investments typically involve an equity exchange.
Private equity firm	Private equity firms source investment capital from high net-worth individuals and firms and typically invest in start-ups during the later stages of growth to take control of them.
Venture capital firms	Venture capital firms invest in new ventures using funds raised from limited partners, such as pension funds, endowments and wealthy individuals. Venture capitalists focus on investing in start-ups that are thought to have long-term growth potential, in order to secure a high return on investment.

70 Adapted from Investopedia and Crunchbase.

Figure 20

Investment round definitions[71]

Stage		Typical range
Pre-seed	• Typically refers to the period in which a company's founders are getting their operations off the ground. • The most common pre-seed funders are the founders themselves, as well as close friends, supporters and family. • Depending on the nature of the company and the initial costs in developing the business idea, this funding stage can happen very quickly or may take a long time. • Investors at this stage are unlikely to receive any equity in the company in exchange for their investment; in most cases, the investors in a pre-seed funding situation are the company founders themselves.	$5K–$100K
Seed	• Seed funding is the first official equity funding stage, representing the first official money that a business raises. Seed funding helps a company finance market research and product development, employ a founding team and determine the company's final products and target demographic. • Potential seed investors include founders, friends, family, incubators, venture capital companies and "angel investors". • Angel investors tend to appreciate riskier ventures (such as start-ups with little or no proven track record) and expect an equity stake in the company in exchange for their investment. • Most companies raising seed funding are valued at somewhere between $3 million and $6 million.	$50K–$1m
Series A	• In Series A funding, investors look for companies with great ideas and a strong strategy for turning ideas into a successful money-making business. • Investors involved in the Series A round often come from traditional venture capital firms and may come as a group led by an "anchor" investor, although companies have also used crowdfunding for their Series A rounds. • Once a company has secured a first investor, it may find it easier to attract additional investors. • Firms going through Series A funding rounds can typically be valued at up to $15 million.	$1m–$10m
Series B	• Series B rounds involve taking businesses to the next level, past the development stage, by expanding market reach. • Through Seed and Series A rounds, companies ought to have developed a substantial user base and proven their ability to scale to investors. Series B funding is used to scale companies for them to meet growing customer demand. • Funding is typically used for recruiting talent, business development, sales, advertising and technology. • Similar to Series A, Series B is often led by many of the same investors, including an anchor investor, but with the addition of a new wave of venture capital or private equity firms that specialise in later-stage investments. • Companies undergoing a Series B round tend to be well established with valuations ranging from $30 to $60 million.	$5m+
Series C	• Businesses that make it to Series C funding rounds are already quite successful, and would typically seek additional funding to help them develop new products, expand into new markets or even acquire other companies. • Series C funding is focused on scaling the company and growing as quickly and successfully as possible. Investors would inject capital into the core of a successful business to receive more than double that amount back. • Series C investors include hedge funds, investment banks, private equity firms and large secondary market groups in addition to the aforementioned investors. • With a successful business model in place, new investors would invest heavily in companies that are already thriving to help secure their own position as business leaders.	$10m+

71 Adapted from Investopedia and Crunchbase.

Figure 21

Investment data on selected Nigerian agritech companies[72]

Agritech	Funding round	Amount ($)	Year	Source of funding	Type of investor
AFEX	Grant	1,500,000	2016	WAFMP	Donor
Afrimash	Seed	5,000	2015	Tony Elumelu Foundation	Donor
Babban Gona	Grant	300,000	2012	AGRA	Donor
Babban Gona	Grant	250,000	2015	Mulago Foundation	Donor
Babban Gona	Grant	4,000,000	2015	Bill & Melinda Gates Foundation	Donor
Babban Gona	Debt	2,500,000	2016	Global Innovation Fund	DFI
Babban Gona	Debt	4,000,000	2017	FMO	DFI
Babban Gona	Grant	1,250,000	2017	Skoll Foundation	Donor
BeatDrone	Pre-seed	5,000	2018	Tony Elumelu Foundation	Donor
BeatDrone	Grant	14,000	2018	Diamond Bank	
BeatDrone	Pre-seed	100,000	2019	Unnamed angel investors	Angel investors
Crop2Cash	Pre-seed	4,000	2018	Tony Elumelu Foundation	Donor
Crop2Cash	Grant	5,000	2019	Wennovation	Incubator
Crop2Cash	Grant	28,000	2019	GIZ CARI	Donor
Crop2Cash	Pre-seed	100,000	2019	FCMB	
EZ Farming	Seed	150,000	2019	500 Start-ups	Accelerator
Farmcrowdy	Pre-seed	100,000	2017	Angel investor and private equity	Angel investor and private equity
Farmcrowdy	Seed	1,000,000	2018	Angel investors, venture capital, private equity	Angel investors, venture capital, private equity
Farmcrowdy	Seed	1,000,000	2019	Angels, venture capital, private equity	Angels, venture capital, private equity
Farmcrowdy	Grant	325,000	2018	GSMA Ecosystem Accelerator	Grant
FarmFresh	Seed	20,000	2015	Fledge VC	Venture capital
Fresh Direct Nigeria	Seed	5,000	2016	Chivas (competition)	Venture capital
Growsel	Grant	25,000	2018	Visa	Donor
Hello Tractor	Seed	30,000	2014	University of Chicago's Social New Venture Challenge	Accelerator
Hello Tractor	Seed	150,000	2014	Unnamed angel investor	Angel investor
Hello Tractor	Grant	50,000	2014	Point of Light Civic Accelerator	Accelerator
Hello Tractor	Grant	80,000	2015	Echoing Green Fellowship	Accelerator
Hello Tractor	Grant	150,000	2016	USAID	Donor
Hello Tractor	Grant	15,000	2019	Founders Factory	Accelerator
Releaf	Seed	120,000	2017	Y Combinator	Accelerator
Releaf	Seed	150,000	2019	Y Combinator	Accelerator
Thrive Agric	Pre-seed	20,000	2017	Ventures Platform	Incubator
Thrive Agric	Seed	150,000	2019	Y Combinator	Accelerator
Thrive Agric	Seed	600,000	2019	Angel investors	Angel investors
TradeBuza	Seed	25,000	2018	Itanna Accelerator	Accelerator

72 Sources: Crunchbase, Digest Africa, PitchBook, GSMA interviews and analysis

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