

# ENTREPRENEURIAL ECOSYSTEMS IN AGRICULTURE

**The Impact of Successful Founders and  
How Decision Makers Can Support Them**

A REPORT BY:

**endeavor**  
INSIGHT

WITH SUPPORT FROM:

The  
Lemelson Foundation



**FOUNDATION**  
SMALL

## ABOUT ENDEAVOR INSIGHT

Endeavor Insight is the research and policy division of Endeavor, a nonprofit organization with a 20-year history of supporting high-impact entrepreneurs around the world. Our team of economists, data scientists, and policy analysts provide data-backed insights on entrepreneurship and its contribution to economic development. We specialize in understanding how entrepreneurship networks can drive job creation and inclusive growth. We partner with organizations that support entrepreneurs, including foundations, multilateral agencies, and corporations.

## ENDEAVOR INSIGHT STAFF

Leah D. Barto  
Alejandro Noguez-Ibarra  
Martin Pickering  
Hamza Shad  
Divya Titus

## ADDITIONAL CONTRIBUTORS

Penmai Chongtoua  
Jin Woo Chung  
Rhett Morris  
Lili Török  
Leyla Unat

## CONTACT

For more information about Endeavor Insight, contact Leah D. Barto at [leah.barto@endeavor.org](mailto:leah.barto@endeavor.org).

## SPECIAL THANKS

The authors of this report would like to thank their colleagues at Endeavor including Derin Adebayo, Adenike Agbakosi, Adrián García-Aranyos, Jake Budler, Patrick Linton, Fiona Mungai, Agostine Ndungu, Dinah Njuguna, Eloho Omame, Dustin Poh, Linda Rottenberg, and Precious Stephens.

We would like to express our thanks to Carol Dahl, Maggie Flanagan, Pam Kahl, and Rob Schneider of the Lemelson Foundation, as well as Thomas Caffrey Osvald, Liz Wilson, Karina Wong, and Gerard Wynne of Small Foundation. The following individuals also provided valuable input as Endeavor Insight developed this report: Keside Anosike, Somachi Chris-Asoluka, Kemdi Ebi, Julius Ecuru, Benjamin Meier, Mbuvi Ngunze, George Osure, Raji Rajan, Jinesh Shah, Martin Slawek, and Simon Winter.

Finally, we would like to thank Onyeka Akumah (Farmcrowdy); Rose Goslinga (Pula); Shashank Kumar (DeHaat); Sunil Kumar (Agventures); Niraj Marathe (CoolCrop); Kola Masha, Lola Masha, and Ubong Inyang (Babban Gona); Ranjith Mukundan (Stellapps); Taita Ngetich (Illuminum Greenhouses); Peter Njonjo (Twiga Foods); and Obi Ozor and Ife Oyedele II (Kobo360).

## THIS RESEARCH WAS MADE POSSIBLE BY FUNDING FROM THE LEMELSON FOUNDATION AND SMALL FOUNDATION.



Based in Portland, **The Lemelson Foundation** uses the power of invention to improve lives. Inspired by the belief that invention can solve many of the biggest economic and social challenges of our time, the Foundation helps the next generation of inventors and invention-based businesses to flourish. The Lemelson Foundation was established in the early 1990s by prolific inventor Jerome Lemelson and his wife Dorothy. To date the Foundation has made grants totaling more than \$290 million in support of its mission.



**Small Foundation** is a philanthropic foundation based in Ireland that is working to catalyse income-generating opportunities for extremely poor people in rural sub-Saharan Africa. Small Foundation's goal is to improve the business ecosystems that proliferate income opportunities for those in extreme poverty by expanding the access of micro, small and medium-sized enterprises (MSMEs) to knowledge, skilled human resources, finance, technology, and markets.

# Executive Summary

Endeavor Insight partnered with the Lemelson Foundation and Small Foundation to understand how entrepreneurial agriculture companies can maximize their impact in developing countries. The purpose of the study is to provide a data-backed assessment of the challenges and opportunities for supporting entrepreneurs. Endeavor Insight's approach used several lenses, including a special focus on the types of innovation the founders have created, as well as an analysis of the dynamics within selected agricultural value chains.

The results offer guidance for decision makers who support entrepreneurs as they address the Sustainable Development Goals (SDGs), especially in raising the incomes of smallholder farmers and alleviating poverty, creating transformative solutions that can address global food security, and generating quality jobs. This study builds on recent research in the international development and social investment communities, and takes into account the impacts of the COVID-19 crisis.

## Impact and Opportunity

A robust agricultural sector is needed to address poverty, food security, and employment in sub-Saharan Africa and in India. The global community has set out to address these priorities with the SDGs as a guiding framework, but several barriers limit these efforts, including the particular challenges that smallholder farmers face. The obstacles have been made greater by COVID-19, which has increased global poverty and food insecurity.

There are clear opportunities for entrepreneurs to address the challenges that smallholder farmers face and to further the SDGs. This research builds on previous segmentation studies in the field, and offers new lenses to examine how successful entrepreneurial businesses grow. When examining companies by innovation type, it reveals the specific strengths they have in helping achieve the SDGs:

- **software companies** have a comparative advantage in reaching smallholder farmers;
- **invention-based enterprises (IBEs)** offer tangible solutions to improve food security and reduce poverty; and
- **business process companies** are well placed to foster job creation.

## Entrepreneurial Challenges

Agricultural entrepreneurs face many challenges in growing their businesses, which hinders the impact they can have. Endeavor Insight identified the most common challenges experienced by agricultural entrepreneurs. Access to capital is particularly challenging for agriculture companies in developing countries. Agriculture attracts fewer institutional investors than other sectors, and there is a scarcity of capital for growth-phase companies. Longer lead times can deter the financing of IBEs. COVID-19 has exacerbated capital-related challenges, but also created opportunities to access funding remotely.

Access to talent is the second most cited challenge. Finding technical talent is particularly difficult for software firms, and qualified managerial talent is often scarce. Some companies are adopting new strategies to attract talent, but recruitment and training have become more difficult due to COVID-19.

## Pathways for Success

Endeavor Insight examined top-performing companies to understand how entrepreneurs are overcoming these challenges.

Further analysis was conducted on each innovation type to uncover patterns among founders' early careers and educational backgrounds, startup and growth phases, and the impact of COVID-19.

Because of their measurable impact and cost efficiency, software companies succeed in securing larger amounts of investment than the other two types of agriculture companies. IBE founders often have advanced academic degrees in cutting-edge fields, and many are returnee entrepreneurs who have had firsthand experience in farming. A majority of business process companies have at least one founder with a business background, which helps them succeed in contributing to local job creation.

## Entrepreneurial Networks

Entrepreneurial networks have various features that can impact the trajectory of individual companies. Entrepreneurship evolves differently within value chains, as seen by a comparison of the export-focused Kenyan macadamia and domestically-focused Nigerian maize sectors. The presence of high-quality mentorship within a network, particularly from those with relevant agricultural experience, can be pivotal in helping companies scale and raise capital.

Support organizations play a positive role in providing access to funding and networks, but the programs are not always tailored to the needs of the agricultural sector. Analysis of founder backgrounds demonstrated a systemic feature of these networks: teams made up of all-local founders face more limited resources than founding teams with at least one expat

or returnee. Previous Endeavor Insight research on Entrepreneur-Led Economic Development offers an approach that decision makers can use to support the success of more local founding teams.

## Recommendations

This report provides practical recommendations for addressing the major challenges that these founders face, with guidance for entrepreneurs, investors, support organizations, donors, policymakers, and universities. Priority areas include:

1. Reframe agriculture as a strategic investment, while helping founders secure capital at different stages of development.
2. Build specialized pipelines for technical and managerial talent.
3. Tailor support programs to the needs of the sector and specific innovation types.
4. Prioritize mentorship from local actors with agricultural experience.
5. Provide an enabling environment for founders that facilitates entrepreneurship.

Ultimately, local innovation and entrepreneurship in agriculture in sub-Saharan Africa and India will enable these developing regions to achieve positive outcomes in poverty alleviation, food security, and job creation.

# Methodology

The findings in this study are based on interviews with more than 80 founders and secondary data from more than 250 companies located in sub-Saharan Africa and India. Of the companies studied, 167 are entrepreneurial companies operating innovative businesses (i.e., software firms, invention-based enterprises, or business process innovators). Interviews were conducted with 47 founders from that set of companies.

For further investigation of the maize value chain in Nigeria and macadamia nut value chain in Kenya, data was collected on 129 companies (37 of which overlap with the former 167). Interviews were conducted with an additional 39 founders for this analysis.

In parallel to this study on agriculture, Endeavor Insight also conducted research on innovative healthcare and clean energy companies, which offer points of comparison. Data was collected on a total of nearly 1,800 investors, grantmakers, mentors, and support organizations, of which approximately one-third supported agriculture companies.

Endeavor Insight's research is rooted in understanding how successful entrepreneurial businesses grow, covering several areas of need including capital, talent acquisition, mentorship, and support programs. Data collection occurred before and during the COVID-19 pandemic, and follow-up research took place in early 2021.

## Key Research Questions

The research process was guided by the following research questions.

- How do agricultural enterprises contribute to poverty alleviation, food security, and job creation?
- What are the key characteristics of high-performing agribusinesses?
- What are the challenges faced by innovative agricultural entrepreneurs, and how do they overcome them?
- How do value chain-level considerations affect entrepreneurs in agriculture and their local impact on smallholder farmers?
- How are ecosystem actors such as investors, mentors, and support organizations helping entrepreneurs?
- How can decision makers better support agricultural entrepreneurs?

## **This study examines entrepreneurial agriculture businesses in India and sub-Saharan Africa through several lenses.**

There are clear opportunities for entrepreneurs to address the challenges that smallholder farmers face and further the SDGs. With a focus on sub-Saharan Africa and India, the research explores how decision makers can best support agricultural entrepreneurs as they grow their businesses.

This study uses various lenses to examine the dynamics that affect agricultural founders in these markets, including the type of innovation that a business has developed, geographic context, and the dynamics of the value chain in which it operates. This approach offers decision makers and stakeholders a more nuanced understanding of how entrepreneurs maximize their impact, and a broader menu of interventions that can support them.

# I. Impact and Opportunity

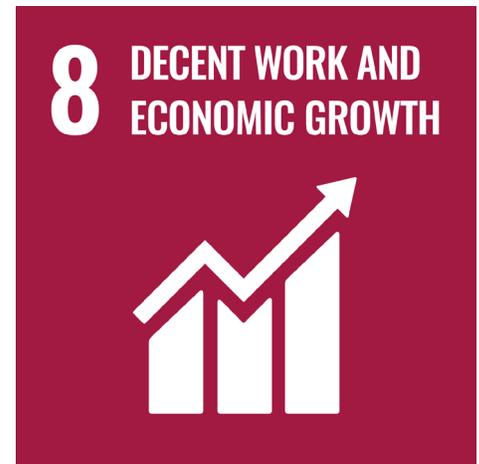
There are clear opportunities for entrepreneurs to address the challenges that smallholder farmers face and to further the SDGs.

## ADDRESSING THE SUSTAINABLE DEVELOPMENT GOALS

**A robust agricultural sector is needed to address poverty, food security, and employment in many countries in sub-Saharan Africa and in India. The global community has set out to address these priorities through the UN's Sustainable Development Goals.**

In 2015, all United Nations (UN) member states adopted the Sustainable Development

Goals (SDGs), which provide a blueprint for making global society healthier and more prosperous by 2030.<sup>1</sup> Although several of the 17 goals are relevant for agriculture, three are directly related: no poverty (#1), zero hunger (#2), and decent work and economic growth (#8). A strong and secure agricultural sector is essential if these ambitions are to be realized.



Agricultural enterprises, including smallholder farms, are critical for reducing poverty and securing the global food system. Smallholders grow food crops and cash crops, both of which provide income, though the former are particularly important for eliminating hunger. An estimated 510 million smallholder farms produce approximately 35 percent of the world's total food, making their work vital for food security.<sup>2</sup>

However, agricultural production needs to outpace the rapid population growth in developing countries if food insecurity and poverty are to be reduced. A 2016 report from

the African Development Bank projected that the number of malnourished people in Africa would rise from 240 million in 2015 to 320 million by 2025.<sup>3</sup> Africa remains a net importer of food, but strong production growth since 2011 has caused net food imports to level off.<sup>4</sup> According to the Brookings Institution, there is considerable variation in the agricultural trade deficit across countries in the continent, with only a handful of countries comprising the majority of imports.<sup>5</sup> Although India is already a net food exporter, the country has almost 195 million undernourished people, which represents one-quarter of the global hunger

challenge.<sup>6</sup> In both regions, demand for food, especially higher-value items, will continue to rise as populations and incomes increase.<sup>7</sup>

There is great potential for improvements in agriculture to alleviate poverty and enhance food security in both sub-Saharan Africa and India. Growth in agriculture is estimated to be “at least twice as effective in reducing poverty” as growth generated in other sectors, thereby providing the greatest benefits for those in need.<sup>8</sup> Africa contains around 60 percent of the world’s undeveloped arable land,<sup>9</sup> and its labor force is set to be the world’s largest by 2035.<sup>10</sup> These realities highlight the potential for the agricultural sector to grow rapidly and contribute to improved standards of living.

In Africa, although employment in agriculture continues to grow, the pace of quality job creation needs to accelerate. Expanding the area of land available to harvest is one important way to increase jobs. Entrepreneurial solutions, however, can have an even greater impact as they also improve average incomes through mechanisms like transitioning subsistence farmers to higher value crops, improving yields, and assisting dynamic enterprises as they move up the value chain into new areas.<sup>11</sup>

### **Smallholder farmers face several barriers, which also limit efforts toward the SDGs in developing countries.**<sup>12</sup>

**Climate change, pests, and disease** have been major sources of low crop yields and inefficiency. Farming and irrigation practices have degraded soil quality and depleted groundwater levels in both sub-Saharan Africa and India, compounding the threat to natural resources brought about by climate change.<sup>13</sup> In Africa, changes in climate such as prolonged droughts, are disproportionately affecting the continent more than other regions, and the continent’s average yields stand at only 56 percent of the international average.<sup>14</sup> This is especially troubling because only a small minority of sub-Saharan African farms are irrigated, resulting in a heavy dependence

on rainfall.<sup>15</sup> In India, climate change and the improper use of some fertilizers have led to land degradation and reduced yields.<sup>16</sup> Climate-related risks will require smallholder farmers to use more recent technologies and adopt new agricultural practices.

**Suboptimal farming practices, older equipment, and low-quality seedlings** are also factors behind reduced yields. Limited access to credit is one reason that farmers in both regions continue to use poor quality inputs and equipment.<sup>17</sup> Smallholders often struggle to gain access to services such as credit and insurance because of **land tenure insecurity**.<sup>18</sup> The vast majority of the world’s poor have no legal control over the land on which they depend. This limits their ability to access institutional credit and inhibits their ambitions to make long-term investments in labor or land-based improvements to increase production. Land tenure insecurity especially affects female farmers.<sup>19</sup>

**The lack of robust public infrastructure** also poses a challenge for those trying to make improvements to agriculture, particularly in Africa,<sup>20</sup> but also in rural India. Many smallholder farmers are located in remote areas, which often lack paved roads and suitable connections to markets. This raises transportation costs and limits the connectivity between rural farms and urban populations that is needed for farmers to have access to larger markets.<sup>21</sup> Limited internet and energy infrastructure further impacts productivity and performance.<sup>22</sup>

**Smallholder farmers have limited access to capital** and often depend on their relatives or acquaintances for loans. Formal financial institutions underserve smallholders because the latter are less likely than other businesses to have a credit profile, a solid track record, or formal information about their operations or management. This makes it difficult for financial service providers to make a reasonable risk assessment. Even if the risks are well understood, potential returns can be too low to be considered a viable investment proposition.<sup>23</sup>

### **COVID-19 has increased global poverty and food insecurity.**

According to the UN, the COVID-19 pandemic has led to the first increase in global poverty in decades, while also contributing to worsening food insecurity. The UN's 2020 Sustainable Development Goals Report estimates that more than 71 million people were pushed into extreme poverty in 2020. Even before the pandemic struck, the UN considered that progress towards the SDGs was "uneven", and that the world was "not on track to reach the goals by 2030."<sup>24</sup> Food insecurity was already on the rise, the natural environment was deteriorating, and inequality indicators had not changed much since the agenda was set in 2015. The pandemic has led to a global health, social, and economic crisis, but its effects have not been felt equally.<sup>25</sup> Rather it has exacerbated existing inequalities, and smallholder farmers have been particularly vulnerable to these shocks.

For example, supply chain disruptions have increased the cost of inputs, and limited market availability meant that many farmers and agro-processors were not able to access raw materials. A large proportion of farmers — 88 percent in Nigeria, according to a survey by the Sasakawa Africa Association — could not access their farms during government lockdowns,<sup>26</sup> and many farmers and entrepreneurs were unable to train or hire new labor.<sup>27</sup>

For many that were in a position to harvest their crops, transport disruptions, increased costs, and supply chain disruptions made it difficult to access markets to sell their produce. The restrictions on movement in early 2020 in many sub-Saharan African countries also coincided with preparations for the main planting season for crops such as maize and rice.<sup>28</sup> Many farmers could not access seeds and other inputs, and

seasonal workers who would normally earn income during that time of year were left without the opportunity for employment.

The farmers already dealing with the effects of climate change and locust invasions faced a limited planting season due to COVID-19. Consequently, they had lower crop yields in 2020.<sup>29</sup>

The sharp reduction in global trade in the first half of 2020 threatened agricultural communities that rely on exporting their products. Demand for export crops like macadamia nuts fell, in line with reduced global trade flows, although staple crops such as maize and rice experienced increased demand. While global value chains and trade in agriculture stalled, strategies to localize food production, such as protective measures introduced by Nigeria, may still have undesirable results. A report from the FAO, "The State of Agricultural Commodity Markets 2020," warns that while it is natural for decision makers to seek to localize production following shocks such as COVID-19, such moves could end up raising domestic food prices by undermining countries' comparative advantages.<sup>30</sup>

COVID-19 has undoubtedly caused much devastation, but it also presents opportunities to improve efficiencies in food value chains, especially through digitalization.<sup>31</sup> Entrepreneurs that are able to take advantage of the rapid changes in work practices can help to strengthen food security, reduce poverty, and offer more job opportunities throughout the developing world.

# OPPORTUNITIES FOR ENTREPRENEURSHIP

## **A comparison of value chains illustrates the different roles that companies play.**

Entrepreneurial companies in the agricultural sector operate within the context of value chains, which represent the full range of business activities that are involved in the production of a good or service. Understanding how value chains are structured, as well as companies' different roles within them, is key to assessing the opportunities for entrepreneurial solutions that can address the SDGs.

Endeavor Insight compared two value chains in sub-Saharan Africa: maize in Nigeria and macadamia nuts in Kenya. They were selected due to their prominence in their respective countries and their impact on livelihood-sustaining businesses, particularly smallholder farmers. The comparison demonstrates important differences in the composition of each value chain and the varying implications for the entrepreneurs operating in them.



## CATEGORIZATION OF VALUE CHAIN SECTIONS

Value Chain Section	Upstream companies	Midstream companies	Downstream companies
<b>Activities</b>	Inputs and equipment that farmers need to grow their crops and increase crop yields.	Services such as fintech and transportation that improve efficiency and yields for farmers.	Purchasers of farmers' produce for processing, selling, and/or exporting it to reach the consumer.
<b>Enterprise Segment</b>	High-Growth, Niche	High-Growth, Dynamic	Dynamic

Note: Enterprise segments refer to the framework outlined in "The Missing Middles" report available from Dalberg Advisors.

Businesses operating in different sections of a value chain have distinct types of relationships with farmers. The value chains under consideration are broadly split into three sections: upstream, midstream, and downstream. As the table above highlights, these sections have specific roles and encompass different enterprise segments.

Founders operating in these sections have unique relationships with the smallholder farmers and their livelihood-sustaining enterprises. Some entrepreneurial companies in this study operate as suppliers of smallholder farmers and others serve as their customers. Farmers' challenges often arise due to their informal status, and formal businesses founded by entrepreneurs can help them increase sales, access finance, reduce risk, and boost efficiency.<sup>32</sup>

This research builds on previous segmentation studies in the field. One is Dalberg's 2018 "The Missing Middles"

study, which identifies four segments of businesses in order to address gaps in finance: high-growth ventures and niche ventures, which are both innovative; dynamic enterprises, which grow steadily; and livelihood-sustaining enterprises, which are the smallest and have modest growth.<sup>33</sup> FSG's 2020 "Bending the Arc" report and RAF's 2019 "Pathways to Prosperity" report also present typologies of business models.<sup>34</sup>

These are useful approaches, but the key findings primarily focus on one area of need in entrepreneurship — capital. Endeavor Insight's approach instead relies on the experience of entrepreneurs and seeks to understand the various challenges they face and the range of dynamics that can impact their growth.

## Identifying companies by innovation type can reveal their specific strengths.

This report identifies three types of innovative companies: software firms; invention-based enterprises (IBEs); and business process companies. Their products and services differ enough to warrant separate consideration, and they also face distinct challenges and opportunities. The table below provides examples companies.

- **Software companies** are defined as those that have primary activities in developing and selling technological solutions and platforms, such as e-commerce or financial technology (fintech). *Example subsectors:* Farmer Finance and Insurance; Online Marketplaces; Digital Supply Chain Solutions; Farmer Advisory Platforms.

- **Invention-based enterprises (IBEs)** are companies that conduct research and development and manufacture at least one component that is a physical product in which the innovation is unique enough to be patentable. *Example subsectors:* Weather-Monitoring Tools; Irrigation Providers; Crop Quality Inspection Tools.
- **Business process companies** primarily deliver a product or service that requires “on-the-ground” operations, and may also involve the use of technology. *Example subsectors:* Transportation and Logistics; Value-Added Production; Agricultural Crop Processors.

Entrepreneurial companies are contributing toward the SDGs in vastly different ways depending on their products or services, intended customer, and other factors that determine their business model.

## EXAMPLES OF COMPANIES BY INNOVATION TYPE

The headquarter country and year founded are indicated in parentheses.

### Software companies (83 total)



**DeHaat**  
(India, 2012)

Digital platform offering end-to-end farmer services, including access to inputs and market linkages



**Farmcrowdy**  
(Nigeria, 2016)

Digital platform linking groups of farmers to resources and markets



**Esoko Networks**  
(Ghana, 2007)

Communications platform for farmer services such as weather forecasts and insurance

### Invention-based enterprises (41 total)



**Illuminum Greenhouses**  
(Kenya, 2014)

Affordable greenhouses with drip irrigation and solar powered sensors



**SunCulture**  
(Kenya, 2013)

Solar-powered irrigation systems



**Barrix**  
(India, 2011)

Eco-friendly pest control measures

### Business process companies (43 total)



**Milkbasket**  
(India, 2015)

Subscription based micro-delivery service for dairy products and groceries



**Twiga Foods**  
(Kenya, 2013)

Digital B2B supply platform for small- and medium-sized vendors



**Ethiochicken**  
(Ethiopia, 2010)

Distributor of chickens to rural farmers in Ethiopia

This study identifies the comparative advantage of each of the three innovative company types when it comes to reaching farmers, addressing poverty and food security, and employment. While all can contribute to the three highlighted SDGs, Endeavor Insight's research suggests that they each have specific entrepreneurial strengths in either serving smallholder farmers, increasing yields and incomes, or reaching the scale of 50 or more employees.

### **Software companies have a comparative advantage in reaching smallholder farmers.**

High-growth entrepreneurial companies that serve large numbers of smallholder farmers are often technology companies that have harnessed the proliferation of mobile internet to help farmers access useful services. These software enterprises provide farmers with modern tools that help improve farming practices and management, and also create markets and business opportunities for farmers that would otherwise not exist. In the dataset collected and analyzed for this report, more software companies serve smallholder farmers than IBEs and business process companies combined — these software firms have served over 10.3 million farmers. Of the top 20 percent of companies in terms of smallholder farmers served, 69 percent are software firms, 23 percent are business process companies, and 8 percent are IBEs.

**DeHaat** in India is one such example. This company provides a one-stop app for over 500,000 farmers to purchase inputs, obtain credit, and access customers.<sup>35</sup> Another prominent tech-focused company in Nigeria, **Farmcrowdy**, helps smallholder farmers benefit from economies of scale that would otherwise be beyond their reach, and connects them with financing, insurance, and transportation solutions. By April 2021, Farmcrowdy had a network of 425,000 smallholder farmers.<sup>36</sup>

### **Invention-based enterprises offer tangible solutions to improve food security and reduce poverty.**

Invention-based enterprises are particularly well suited to address global food security and poverty reduction because they develop new, tangible technologies that transform the way that food is produced. These kinds of companies are predominantly “niche” or “high-growth” small and medium-sized enterprises (SMEs).<sup>37</sup> This report considers entrepreneurial companies that adapt existing technologies as developing “incremental” innovation. Businesses that are significantly changing the ways that agriculture operates and populations access food are considered to have made “breakthrough” innovations. Endeavor Insight's research found that more than two-thirds (67 percent) of the agriculture companies that have made breakthrough innovations are IBEs. These companies are characterized by their focus on new technologies for irrigation, energy, storage, automation, and pest/disease management, all of which help farmers improve yields and increase their incomes. The IBEs included in the dataset are also responsible for nearly 40 patents.

For example, the products made by **Illuminum Greenhouses**, a Kenya-based IBE, protect crops from pests and disease, while optimizing conditions for plant growth. Similarly, **SunCulture's** irrigation kits maximize the efficiency of water usage while also increasing yields.

### **Business process companies are well placed to foster job creation.**

Entrepreneurial companies that operate on the ground to facilitate the exchange of goods and services have greater potential for creating jobs, relative to IBEs and software firms. These would be considered “dynamic” SMEs, according to Dalberg's definitions.<sup>38</sup> Previous Endeavor Insight research found that companies reaching the scale of 50 employees or more are responsible for creating a disproportionately large share of jobs.<sup>39</sup> The analysis conducted for this project found that the average employee size of agriculture business process companies is much larger than other types of innovative companies: 97, compared to 62 for IBEs and 54 for software firms. These companies have created a total of over 3,600 jobs. Of the top 20 percent of companies in terms of reaching the scale of 50 or more employees, 44 percent are business process companies, 25 percent are IBEs, and 31 percent software firms.

For instance, **Milkbasket**, an Indian business process company which provides subscription-based delivery services for dairy products and groceries, has over 300 employees across the country.<sup>40</sup> Additionally, Kenya's **Twiga Foods** has around 1,000 employees and provides a digital marketplace for small retailers across Africa, leveraging the data to build an efficient supply chain. The company cuts out the brokers who act as middlemen in these sales, providing higher prices for farmers' produce.<sup>41</sup>

**Samir Ibrahim**  
Co-founder and CEO,  
SunCulture (Kenya)  
*Endeavor Entrepreneur*





## CASE STUDY: Illuminum Greenhouses

The disruptive technology created by Illuminum Greenhouses demonstrates the local capacity for innovation in Kenya and the ability to quadruple crop yields.<sup>42</sup>

Taita Ngetich (*below left*) grew up on a farm in the Kenyan highlands and started planting his own crops as a way to increase his income during university. He lost his first crop of tomatoes to pests and disease, so he researched greenhouses and used them as a solution. When neighbors took interest in getting their own, the idea for Illuminum Greenhouses was born.

Ngetich launched the Kenya-based company with University of Nairobi classmate Brian Bett in 2014. Their goal was to modernize farming in Africa and cater to the needs of smallholder farmers. They used their mechanical engineering background to develop greenhouses that were suited to Kenya's climate and agricultural conditions. Their user-centric approach to product development involved testing prototypes with farmers and incorporating feedback into the final design, which features a drip irrigation system.

The company was incubated at the Nairobi-based mLab incubator in 2015 and participated in the Spring Accelerator in 2017. Ngetich recounts that "mLab

offered critical support at the idea stage. We were students with an idea and had to learn how to make it into a business. mLab gave us space and a team. They helped us build our business model and shared insight on how to go to market."

Ngetich learned two key lessons in the early years of the company. The first was the importance of building a strong team with skilled technicians. The company initially relied on hiring recent graduates to staff its technical team, but realized they needed more experienced staff to fuel the company's growth. Ngetich also learned how challenging it was to access venture capital networks. Fortunately, he was able to secure grants from philanthropic organizations early on by finding opportunities via newsletters and social media.

The company continues to rely on grants and revenue for growth. Illuminum received a grant of £900,000 (\$1.2 million) from Innovate UK in 2020. According to Ngetich, accessing venture capital is more difficult for African founders: "Venture capital firms typically have offices in the U.S. or Europe. Having an expat founder makes funding discussions easier, as these discussions begin in their home countries. As local African founders we faced a barrier to access capital, but the narrative is changing. Local offices are being set up by funds in Nairobi, and we are now able to network locally." Ngetich also describes how support organizations provided the young company with visibility and "a stamp of approval" as the company "caught Innovate UK's attention because of Spring Accelerator, and Spring Accelerator had heard of us because of mLab."

In response to a logging ban by the government,<sup>43</sup> Illuminum was unable to continue using wood for its greenhouses, and changed the design to have a steel frame instead.



This adjustment ended up helping the company's international expansion, as it is easier to ship the greenhouses. Illuminum now also serves customers in South Sudan, Somalia, Uganda, and Tanzania. Illuminum has grown to serve more than 16,000 farmers across these five countries.

The company addresses the first two SDGs, eliminating poverty and ending hunger, through its durable and effective greenhouses.<sup>44</sup> Smallholder farmers who use the company's greenhouses have witnessed a four-fold increase in yields. According to Ngetich, "We have had an overall positive impact on food security, which has been critical during the pandemic. Our greenhouses have led to increases in agricultural production in smaller, more rural areas." In addition, the sale of each greenhouse in Kenya creates employment for four people in the country.

The company has diversified its product line and now offers a range of "smart farming" solutions, including solar-powered sensors and a cloud-based system for data monitoring. Through a partnership with microfinance institution Juhudi Kilimo, Illuminum Greenhouses also uses its sensor data to offer credit scores to farmers with the aim of improving their access to credit. Looking ahead, Ngetich hopes to deploy their new products across East Africa by 2025 and to establish franchises in West Africa and India.



## II. Entrepreneurial Challenges

Agricultural entrepreneurs face many challenges in growing their businesses, which hinders their success.

### ACCESS TO CAPITAL

Access to capital is a common challenge for any entrepreneur, but it is particularly difficult for agriculture companies in developing countries. Based on interviews conducted by Endeavor Insight, 68 percent of founders in sub-Saharan Africa and India identified accessing capital as a major or severe obstacle to growing their businesses. The graph on the following page illustrates that capital was the highest ranked challenge for founders in this study (68 percent), ahead of access to managerial talent (53 percent) and all other obstacles.

Several studies have identified the existing mismatch of funding available for agricultural SMEs. The Rural Agricultural Finance Learning Lab's "State of the Sector" report found that 70 percent of global demand for smallholder finance is unmet, with a particular concentration in long-term agricultural finance, for which 98 percent remains unmet.<sup>45</sup> Within sub-Saharan Africa, even though agriculture accounts for 60-70 percent of employment and 25-30 percent of GDP, it receives less than 5 percent of bank loans.<sup>46</sup> A major reason for the mismatch, according to some founders, is that they are not able to provide the large or more immediate revenue streams that investors desire. This echoes findings from Dalberg and the World Resource Institute, which show that investors have a preference for larger companies with a more immediate high-growth potential.<sup>47</sup> This reality, along with the variable cash flows due to the seasonal and unpredictable nature of agriculture, can make investors wary of the sector.

Founders of agriculture companies therefore have to rely on a limited subset of capital providers — including

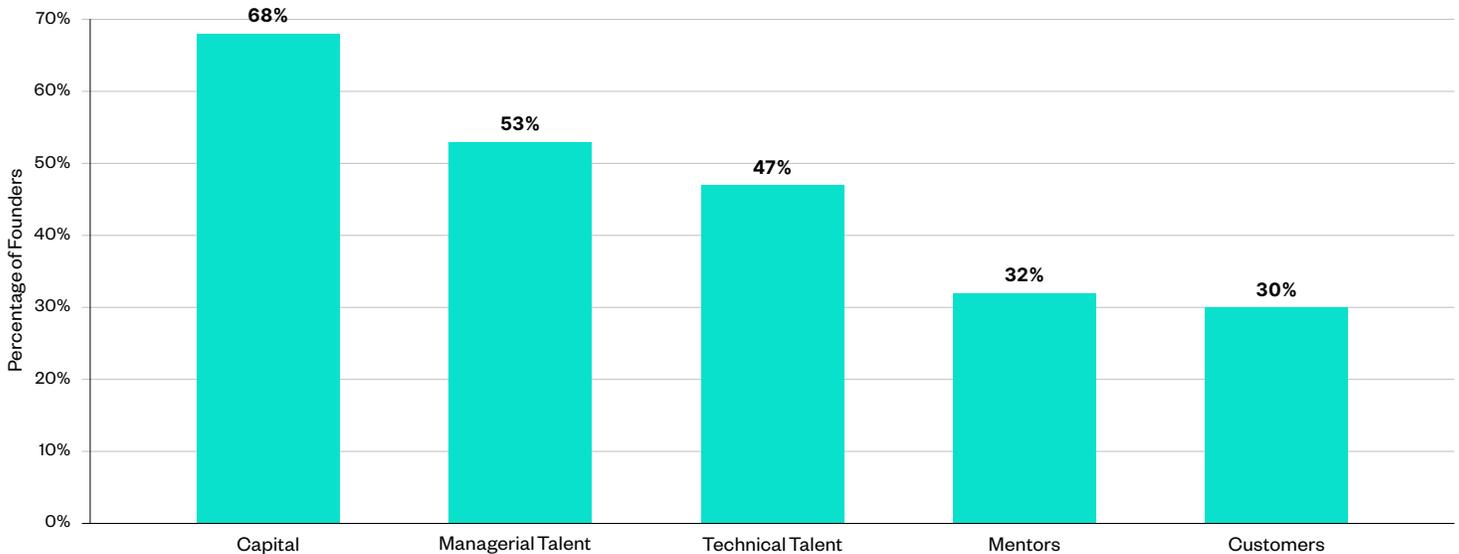
institutional investors, angel investors, and grantmakers — who are willing to look past the typical criteria of swift profitability and low perceived risk. However, these investors are not always knowledgeable about the sector. Agricultural founders frequently cited investors' lack of interest in, or knowledge of, agriculture and the rural context in which they operate as obstacles to their growth. Compared to the clean energy and healthcare companies studied, more agriculture company founders reported that investors are not sensitive to the needs of their business models.

Finding the right source of capital can be especially difficult for founders who have lived and worked solely in a developing country. These local founders, who have not gained contacts from educational or professional experiences abroad, frequently describe the exclusionary nature of global funding networks and the difficulty of knowing "the right people" to gain funding.

At the same time, there are geographical nuances within the sector. For example, there has been rapidly growing but uneven interest in agtech, which refers to the use of technological solutions for agricultural services and products. Growth in agtech investment in India far outstripped that in Africa between 2015 and 2019, though both regions experienced substantial increases. Investment in agtech in India increased from \$5.7 million to \$244.6 million from 2015 to 2019,<sup>48</sup> while investment in agtech in Africa increased from less than \$10 million to approximately \$80 million over the same period.\*<sup>49</sup>

\* While the data from these two sources may not be strictly comparable due to their individual methodologies, it is reasonable to conclude that the agtech sector in India has experienced a sharper rise in funding opportunities than that in Africa.

## GREATEST OBSTACLES REPORTED BY FOUNDERS OF AGRICULTURE FIRMS



Note: Figures represent the percentage of interviewed founders of agriculture firms who reported access to each category as a major or severe obstacle.

Source: Endeavor Insight interviews and analysis. Sample size: 80 founders.

### **Agriculture attracts fewer institutional investors than other sectors.**

Funding from institutional investors, such as banks, is critical for entrepreneurial companies as they grow their businesses. Endeavor Insight analyzed over 800 institutional investors who were active in funding innovative companies in sub-Saharan Africa and India. Only one-third had invested in an agriculture company. This is slightly below the proportion that had invested in clean energy companies (35 percent) and significantly below those that had supported healthcare companies (53 percent).

Further analysis of the most active institutional investors in the sample — those that had invested in three or more companies across the sectors — identified their priorities. Only 37 percent of the institutional investors in this sample were explicit about supporting agriculture companies on their websites.

While institutional investment is increasingly available in developing countries, it continues to come primarily from offshore sources. A large share of the most active

investors are headquartered in OECD countries, which represent the most developed economies, and several founders noted that the geographical distance makes it difficult to build relationships with them.

### **Angel investment is a crucial source of funding.**

Angel investment, which refers to investments in a company made by an individual, not on behalf of a business or investment firm, is a crucial source of funding. Angel investors often bring relevant experience as former entrepreneurs or successful business leaders. This research analyzed over 300 angel investors across the three sectors studied. Overall, agriculture companies were less likely to raise angel investment than clean energy and healthcare companies. Only 20 percent of agriculture companies received angel investment, compared with an average of 26 percent of companies in the other two sectors.

Angel investors typically take a personal interest in helping a company scale, and often also act as mentors for their investees. Angel investors with the most relevant

knowledge are better positioned to help founders overcome challenges, especially those that are particular to a given sector or geography. However, Endeavor Insight's data shows that angel investors who support agricultural entrepreneurs rarely have direct experience within the sector. Of the 33 most active angel investors in agriculture — those who have made investments in two or more agriculture companies — only two had previously worked in the sector.

The angel investors that are funding agriculture companies are primarily focused on software, which parallels their professional backgrounds. Angel investors that are supporting agriculture are more likely to have previous professional experience with software companies, but have very little experience with business process companies or IBEs. Consequently, angel investors may simply be focusing their investment on the types of companies with which they are already familiar.

Although the investors in agriculture companies mainly have professional experience in the relevant geographical market, the data indicates that local angel investors are more prevalent in India. Conversely, investors funding agriculture companies in sub-Saharan Africa are more likely to be based abroad. Looking specifically at Kenya and Nigeria, the large majority of the angel investors are foreign-based, except for a few local to Nigeria. As with the general trend, most of these individuals have relevant professional experience, but not specific to agriculture. Several founders noted that because of foreign angels' lack of understanding of agriculture, they may not be best suited for understanding the dynamics between companies and local farmers.

### **Grant funding is relatively common for agriculture companies.**

The data from this research indicates that grants are a relatively common source of funding for agriculture companies, but interviews showed that founders have mixed views about them. More than one-third of agriculture companies in this study secured funding from philanthropies, with grant funding being much more prevalent among companies headquartered in sub-Saharan African than in India. This may reflect geographic contexts more than sectoral patterns: India has a greater presence of angel and institutional investors than sub-Saharan Africa, meaning that African companies are relatively more reliant on grant funding.

Some founders cited a preference for grants over private funding because there is less pressure to create an immediate profit for investors. In particular, one founder described how grant funding allows more flexibility and time for the business to develop a suitable business model.

Still, there are drawbacks to grant funding. Common downsides that founders cited include the amount of time and staff resources needed to complete funding paperwork and reports, the lengthy timelines for receiving funding confirmation, and the delays in business operations caused by the payment structure of many grants, where funds are often disbursed in smaller installments over time. When founders are awaiting decisions on their grant applications, it creates an opportunity cost for pursuing other sources of capital. Plus, from the perspective of investors, an overreliance on grants can be perceived as an indication of the lack of marketability and profitability of the company's business model.

**There is a scarcity of capital for growth-phase companies.**

Founders reported that capital is scarce for companies trying to expand, which reflects other studies. Dalberg’s “The Missing Middles” study notes that growth ventures typically have a much greater need for external financing, and while tech-oriented companies are often a good fit for VC financing, companies with physical products, asset-heavy companies, and innovative enterprises pioneering new business models are not as well served.<sup>50</sup>

In this study, some founders noted a mismatch of dynamics between local and foreign investors. While local investors have a deeper understanding of growing companies’ needs, founders reported that they tend to seek returns in shorter spans of time and

do not provide large enough ticket sizes needed for expansion. In contrast, foreign investors are less familiar with the contextual factors affecting a business’s growth, but are more flexible and patient.

Some founders interviewed for this study went into personal debt and relied solely on revenue from initial product sales to run their companies, leaving few resources for growth.

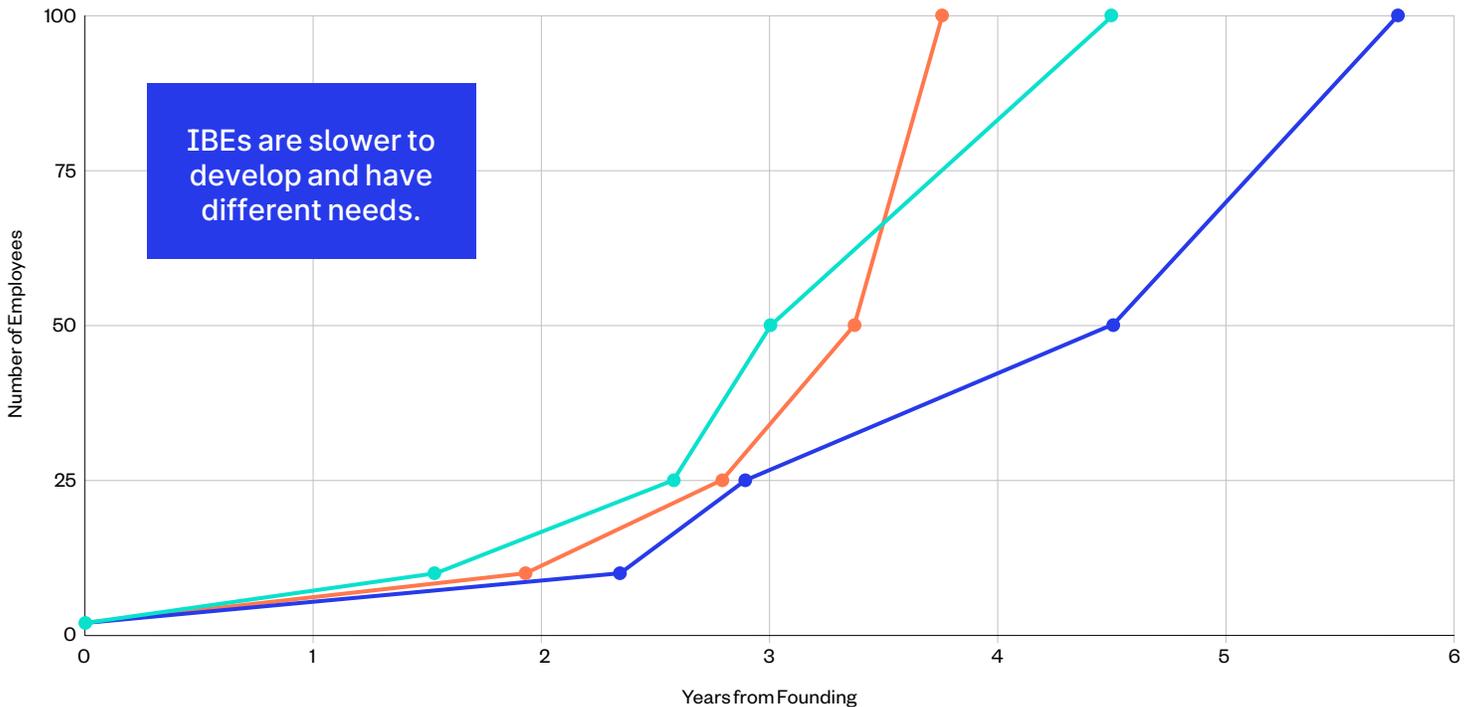
Entrepreneurs who bootstrap — i.e., use their personal finances and operating revenues to run their business — had two primary reasons for their decision: difficulty in accessing capital and founders’ own desire to not pursue it. For a few founders, the flexibility to develop their own business model independent of investors’ expectations and recommendations is worth the foregone capital.

**Longer lead times can be a constraint on financing IBEs.**

As the graph below illustrates, IBEs generally have longer development timelines than their peers in software or business process innovation. There are more steps involved in the development of physical products, from sourcing raw materials to testing prototypes. Many IBE founders mentioned in interviews that potential investors are hesitant to provide capital because they see invention-based businesses as riskier than companies offering other types of goods and services. Some IBE founders have overcome this higher barrier to capital by bootstrapping in order to build workable prototypes. Then they can run pilot projects and demonstrations with those prototypes as a proof-of-concept for investors, easing their concerns.

**COMPARATIVE DEVELOPMENT TIMELINES OF COMPANY INNOVATION TYPES**

■ BUSINESS PROCESS ■ SOFTWARE ■ IBE



IBEs are slower to develop and have different needs.

Note: Data includes entrepreneurial companies that reached 100 or more employees across three sectors (agriculture, healthcare, and clean energy).

Source: Endeavor Insight interviews and analysis. Sample size: 131 companies.



Access to bank loans is important for any type of company in need of working capital or bridge funding, but the data shows that entrepreneurial agriculture companies are less likely to receive funds from lending institutions than companies in other sectors. This source of funding was particularly difficult for agricultural IBEs. According to one IBE founder, banks are risk averse and have no interest in funding products that have no precedent or existing comparison in the market.

**COVID-19 has created opportunities, but also exacerbated some capital-related challenges.**

The ability to connect with investors remotely has the potential to level the playing field for companies that were previously struggling to build relationships, such as those led by local founders.<sup>51</sup> Some founders were able to take advantage of their “essential” status in food supply chains during the pandemic to generate government interest in providing new contracts or investment.

One study looking at the effects of COVID-19 on capital found that many philanthropies accelerated disbursements to existing grantees, or lowered thresholds for accessing finance. This was in reaction to increased caution from commercial venture capitalists and impact investors in the face of the uncertainty created by the pandemic, with many such investors scaling back or pausing investments.<sup>52</sup>

However, many companies continue to struggle. Delays in shipping, both to receive input materials and to deliver finished products, negatively impacted emerging companies’ revenue flows. The inability to form connections with investors at industry conferences contributed to the disruption of funding rounds, forcing entrepreneurs to adjust their business plans from expansion to survival. The sharply increased risk associated with struggling companies, as well as investors’ needs to maintain portfolios elsewhere, continues to affect investment provision across the sector.

# ACCESS TO TALENT

When asked about barriers to growing their companies, agricultural founders cited talent as the second most challenging aspect. Specifically, two types of skilled labor are needed most in the two regions covered: technical and managerial talent. Results from the interviews show that 53 percent of founders identified hiring qualified managers as a major or severe obstacle, while 47 percent identified hiring engineers and other technical talent as such.

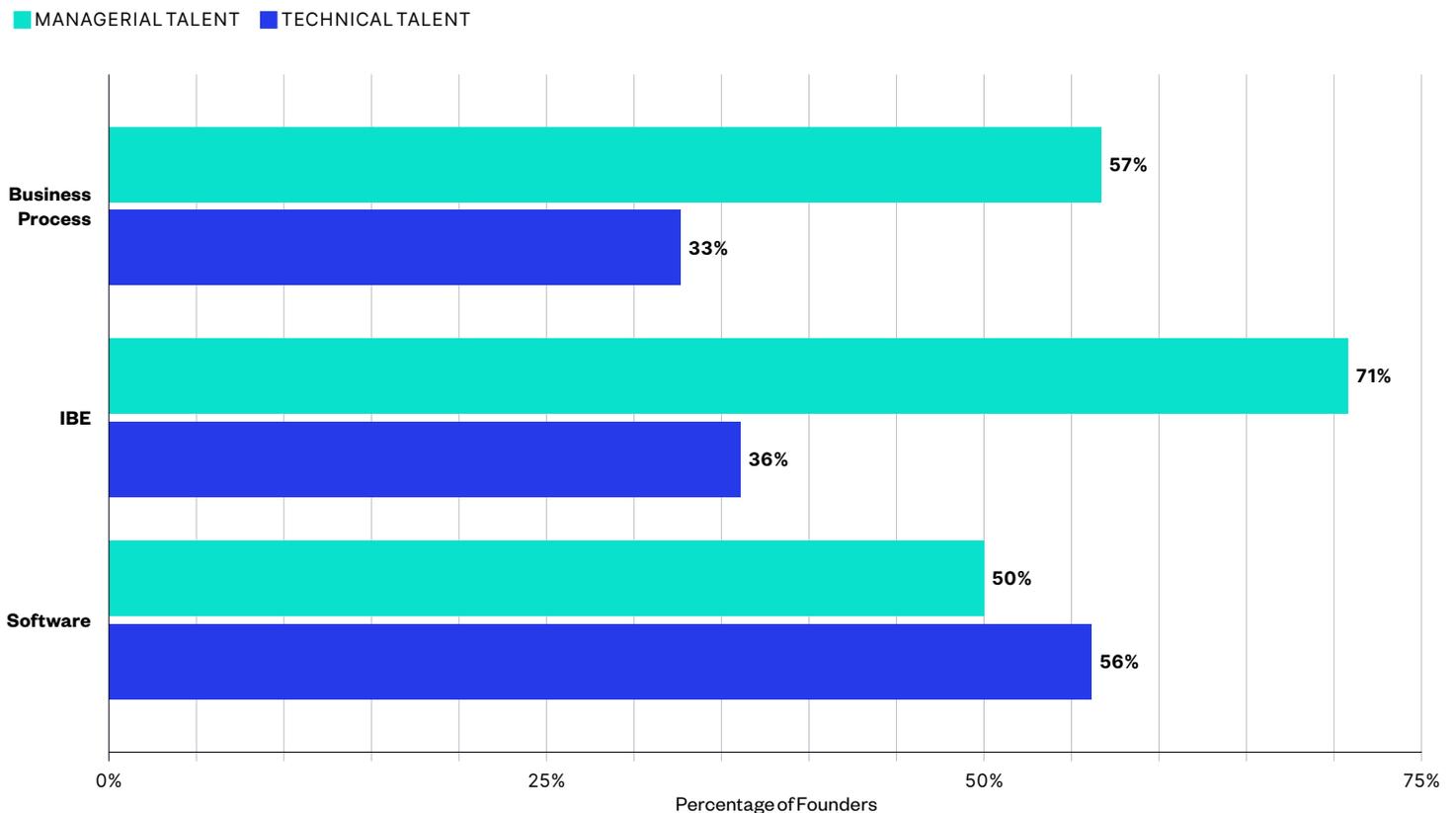
## Technical talent is particularly important for software firms.

Specialized technical talent, including software and mechanical engineers, is particularly important for software firms

due to the nature of their services. The graph below shows that software companies report having more difficulty accessing qualified engineers than both business process companies and IBEs. One IBE founder noted that the highly technical skills in robotics required for his business idea has made it expensive and difficult to assemble a qualified team. Geographic factors also have an impact, with many founders noting that it can be a challenge to recruit high quality talent in cities and it is even tougher when they look to expand in rural regions. In urban settings, entrepreneurial founders face competition from more established firms, while working in rural areas may be viewed as less desirable by candidates.

## PERCENTAGE OF FOUNDERS REPORTING ACCESS TO TALENT AS AN OBSTACLE

Software companies struggle the most with technical talent, while IBE founders report the most difficulty with managerial talent.



Note: Figures represent the percentage of interviewed founders of agriculture firms who reported the availability of managerial or technical talent as a major or severe obstacle.

Source: Endeavor Insight interviews and analysis. Sample size: 37 founders.



### **Different types of managerial talent are needed as companies grow.**

Managerial talent is needed at both the startup phase and the growth phase, though the skills required change as a company expands. In interviews, founders questioned whether the managers they had brought on towards the beginning of the company would also be equipped for later phases of growth. Hiring fresh graduates is not an option for many managerial roles, so founders often need to poach experienced talent from existing companies in the sector. While there are some talent-focused support programs available, their utility is limited in addressing the need for experienced managers of growth-stage agriculture companies. For example, one founder recounted that hosting fellows that were sponsored by an impact investing organization actually ended up hurting the company.

### **Companies are adopting new strategies to attract talent.**

Although it can be difficult to assemble a qualified team of people who are willing to live and work in rural areas where agriculture companies operate, some founders are developing new partnerships and strategies to manage talent acquisition. Apprenticeship programs that are tailored to agriculture can serve as a local pipeline to bridge existing gaps by matching the right skills to where they are needed. One organization providing such a program is Partners in Food Solutions (PFS), which runs an apprenticeship program in six African countries. PFS connects young local talent, especially

engineers and technicians, to agriculture companies. This gives the apprentice valuable hands-on experience and the company a vetted, qualified candidate who can potentially be hired full-time.<sup>53</sup>

Some companies are focusing on brand recognition and marketing to raise their public profile, while building strong HR teams in tandem so that they can aid recruitment. **Babban Gona**, a business process company in Nigeria, has worked to increase the visibility of its impact on farmers.<sup>54</sup> The company accepts that agriculture has not historically been as attractive to job seekers as oil and gas or financial services, and that social impact does not attract everyone. However, they believe that spreading the word about how they are improving outcomes for farmers can attract qualified talent, while also increasing its portfolio of farmers.

Indian agriculture companies have been successful in hiring from the local rural areas in which they operate, rather than recruiting talent that would need to relocate from urban locations. India also has many incubators and accelerators linked to local universities, especially the system of Indian Institutes of Technology (IITs), which provide a pipeline of talent to agriculture companies. Because technical talent is vital for product development in early stages, successful IBE companies in India have used initial angel investment to pay competitive salaries to build a strong team that can conduct research and development (R&D) and build their products.

## COVID-19 has introduced difficulties in recruitment and training.

A survey conducted by the Sasakawa Africa Association found that 83 percent of agriculture companies in Nigeria had not received training in agricultural and related issues because of the pandemic, and that throughout sub-Saharan Africa the “teaching and learning processes of the universities and agricultural colleges has [sic] been significantly reduced.”<sup>55</sup> Ife Oyedele II, the co-founder of Nigerian company **Kobo360**, reported that 30 percent of the firm’s trucking fleet had been disrupted because employees were unable to work due to government-mandated restrictions.<sup>56</sup>

The pandemic will have long-term implications for local job creation and the use of remote talent in agriculture. Some founders had already made significant adaptations to build up remote work capabilities before the pandemic, including the outsourcing of technical roles among Africa-based companies to India. Since COVID-19, the trend towards remote work has accelerated. The transition has been costly in terms of time and effort, but has also led to greater efficiencies through the digitalization of systems. This shift may enable more pipelines for talent, as some founders reported an increase in applications from late 2020. The greater availability of remote talent is particularly beneficial for software companies, since their products are digital in nature and they require technically skilled staff.



## GOVERNMENT POLICIES

During interviews conducted for this research, agricultural entrepreneurs frequently cited government policies and regulations as obstacles to growing their businesses. **Uncertainty, complexity, and corruption** are the main factors that contribute to government-related challenges in the countries studied.

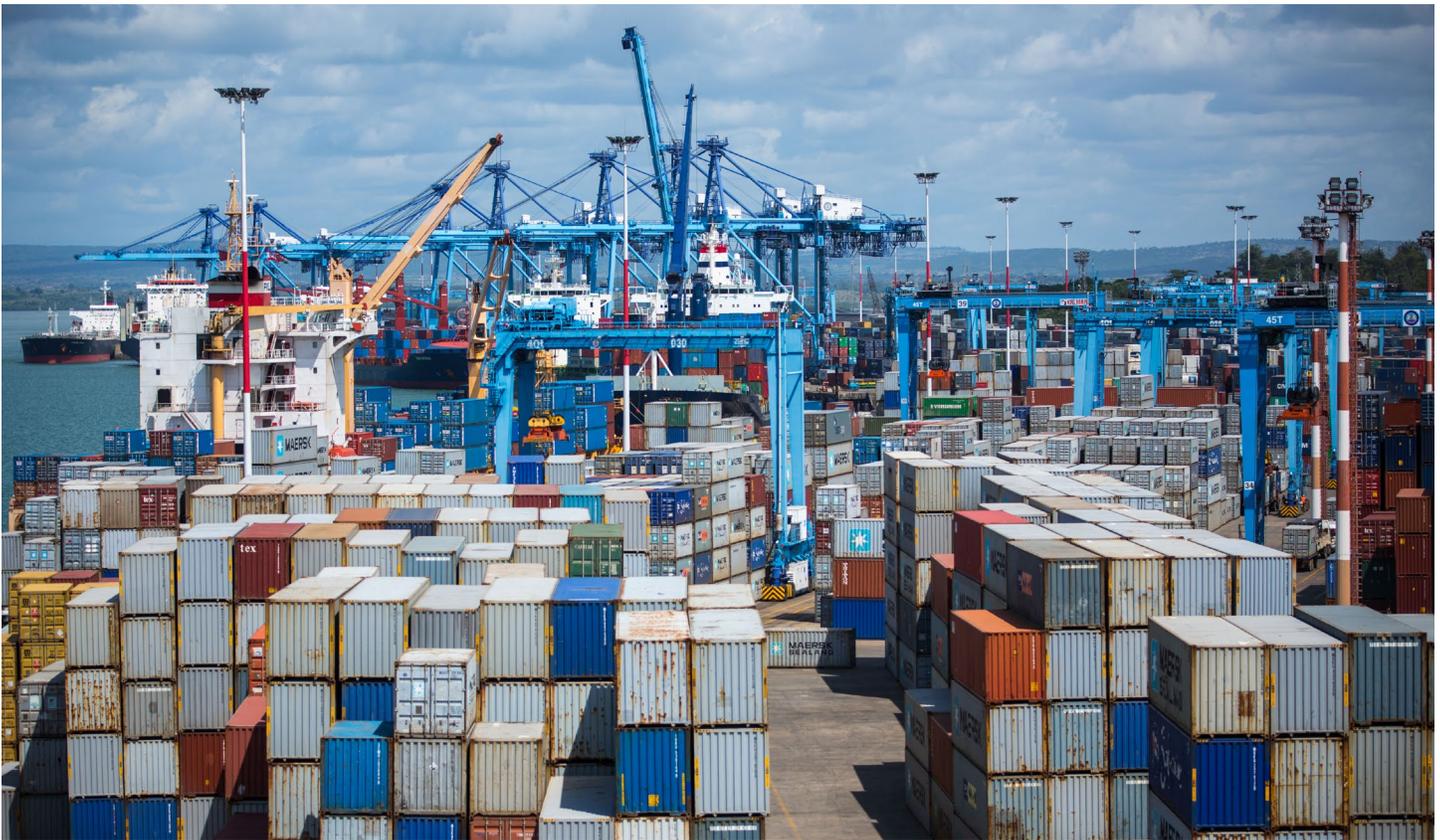
Entrepreneurs benefit from certainty because frequent changes or inconsistently applied regulations undermine their long-term planning and the confidence of investors. For example, one founder reported that banning input materials, such as certain plastics and woods, caused major delays in finding alternatives for product development. However, a total lack of regulation also creates uncertainty. Entrepreneurs operating on the frontier of new technologies like agtech and fintech face an unknown regulatory environment in some developing countries without established protocols or policies for their products. Regulations must be developed at a faster pace and aim to provide a more enabling environment for local entrepreneurs entering new and innovative sectors.

Overly complex regulations can also increase the cost of operating a business and create barriers to accessing new markets. In most countries, the agricultural sector is heavily regulated, given the consequences for public health, but bureaucratic inefficiencies, such as copious amounts of paperwork or the need to obtain multiple licenses and permits, frustrate many entrepreneurs. For example, one Kenyan founder recounted major delays to shipments because they were stalled at ports for months while waiting for permission to proceed. In India, a founder noted the inefficiency and time costs associated with physical paperwork, specifically “know your customer” (KYC)

regulations. Fortunately, there has been some progress, with companies in India now able to process KYC documentation online.

Unfortunately, many of the countries included in this study rank poorly on Transparency International’s 2020 Corruption Perceptions Index.<sup>57</sup> They also rank poorly in the World Bank’s 2020 “Doing Business” report, which assesses countries based on the ease of conducting business operations like paying taxes, obtaining permits, and conducting trade.<sup>58</sup>

There are, however, some signs of progress on these fronts. Nigeria rose from 146th position in the 2019 “Doing Business” ranking to 131st in 2020, with improvements noted in the ease of trading across borders. India similarly rose from 77th position to 63rd.<sup>59</sup> When analyzing government policies and regulations specifically in the agriculture sector, the World Bank also found these regions to be underperforming, but noted that countries in Sub-Saharan Africa are leading the way in positive reforms.<sup>60</sup> Improving government accountability, transparency, and the ease of doing business is vital for not just agricultural enterprises, but all sectors.



**COVID-19 has brought the private and public sectors closer.**

Several interviewees noted that the COVID-19 pandemic has improved relations between governments and the private sector. The urgency of the food security crisis brought about by the pandemic has led to greater cooperation, and communication channels remain open. Governments now appear more understanding of the need for cooperation with the private sector, and some have strengthened or started new partnerships to work with agricultural entrepreneurs. This is an important development because governments play a large role not only in regulating agriculture, but also in shaping market dynamics as major purchasers and subsidizers of agricultural goods. In India, founders reported government interest in promoting the aggregation of smallholders into farmer producer companies, which increase

their market power and provide new opportunities for entrepreneurial solutions.

In the wake of the increased poverty and hunger wrought by the pandemic, the African Continental Free Trade Area (AfCFTA) came into effect at the beginning of 2021.<sup>61</sup> This agreement between 55 African countries eliminates 90 percent of trade barriers, enabling free trade and movement.<sup>62</sup> It will greatly increase economic activity between African countries through the reduction of barriers to trade and investment. For the agriculture sector specifically, AfCFTA will open new markets, increase food availability, and provide more stable prices for farmers.<sup>63</sup> At this critical juncture, it is necessary for the governments of African countries and India to devote more attention to policies and partnerships that can aid both smallholder farmers and the entrepreneurs who are serving the sector.

### III. Pathways for Success

There are various trajectories for founders to achieve impact in the agriculture sector.

In order to better understand how entrepreneurs are overcoming these challenges, Endeavor Insight conducted further analysis of the top-performing companies within each segment — those that have:

- successfully grown to serve large numbers of smallholder farmers;
- developed a breakthrough innovation to increase yields and incomes; and
- reached significant scale to employ hundreds of people.

The following profiles outline the pathways for entrepreneurial success by identifying the common patterns among the most successful companies in the dataset, the traits and stories of the founders who started these companies, useful metrics for assessing companies like them, and opportunities for attracting further support.

Many of the top-performing entrepreneurs interviewed for this study were driven to found agriculture companies with the specific purpose of social impact, including food security and sustainability. These founders have worked to apply their skills to problems in agriculture after learning of the challenges faced by farmers including input costs, accessing capital, and protecting yields. Their introduction to the sector often came from co-founders, or from farmers with whom they have spent time directly. Certainly, those with firsthand experience growing up on farms or in rural environments benefit from contextual knowledge that can reduce their barriers to entry.

Returnees, who comprise a large share of the founders studied, cite a desire to “give back” to their home countries using educational and professional experience gained overseas.

For example, the co-founder of **Babban Gona** states that their primary motive was to address the unemployment rate in areas of political unrest, and thereby to provide a “productive means of income” for people and contribute to social cohesion.<sup>64</sup> (See also the case study on page 36.)

The business model of each innovation type lends itself to a particular type of impact. Software companies have an advantage in experiencing rapid growth in customers, given the easy and low-cost accessibility of their products. The number of farmers that these companies reach tends to be higher than other innovation types, as mobile usage rates have greatly increased in developing countries. On the other hand, agricultural IBEs are particularly strong in developing innovative physical products to address food security and poverty. Finally, business process companies frequently hire more employees than software companies or IBEs because of their labor-intensive tasks.



## SEGMENT 1 — SERVING SMALLHOLDER FARMERS

Software companies are the most likely to have grown to serve large numbers of smallholder farmers of all three innovative company segments. The profile below outlines the common attributes of successful software companies and their founders, who often bring specialized technical talent.

### **Company Characteristics**

The business model of software companies is particularly well suited for reaching a large number of rural customers and providing them with valuable services. The software companies studied mainly focus on providing finance, insurance, e-commerce, or crop data management for farmers, usually in the form of a mobile phone app.

With mobile usage rates rapidly increasing among farmers in developing countries, it is becoming easier for software companies to significantly expand their customer base, due also to the digital nature and easy accessibility of their products.<sup>65</sup> The nimble nature of their business models means that software companies can maximize their impact on smallholder farmers with lower staff numbers than the other company types. Consequently, this segment is growing rapidly. On average, software companies are also a few years younger than other innovation types.

### **Founders' Early Careers and Educational Backgrounds**

Founders of software companies tend to be highly educated, typically with advanced degrees in engineering, business, or computer science. Many are returnees, having spent time and gained educational or work experience abroad before returning to launch their companies. These experiences abroad help founders build networks that can lead to securing important resources like investment and learn from examples of entrepreneurship in other contexts.

Founding teams of successful software companies often bring together different skills and realms of expertise that

complement each other. The founders who were interviewed frequently recounted that one or more of them had technical experience, while the other member(s) brought experience in agriculture or the geographical area. A combination of talents can help to problem solve as well as enable deep knowledge across the different parts of a business.

### **Startup Phase**

In the startup and pilot stage, software founders most often utilize grants and investments to test and solidify their business model. Grants are beneficial for the early development of software companies, as they offer more flexibility than VC to adapt. Some founders met their investors early on through university alumni networks or at companies where they previously worked. Software companies in agriculture are also more likely to have participated in support organization initiatives such as accelerators than IBEs and business process companies. This may be attributable to the origin of many accelerator programs' models in Silicon Valley, which are optimized for software startups but not necessarily for other types of companies.

### **Growth and Expansion Phase**

Because of their measurable impact and cost efficiency, software companies succeed in receiving the attention of VC firms and securing large amounts of capital. Software companies receive more angel investment, as well as institutional investment, than the other two types of innovative agriculture companies.



More investors, especially in India, are now attracted to agricultural software companies because of their potential for high volume, even with low margins. Among the top-performing agriculture companies that have served large numbers of smallholder farmers, software companies such as **DeHaat** have raised as much as \$46 million. Examples of agriculture software companies securing venture capital include **Gramophone** and **Pula**. Gramophone received \$3.4 million in a Series B funding round led by VC firm Siana Capital in 2020 as a result of growing farmer adoption,<sup>66</sup> while Pula raised \$6 million in Series A funding from VC firm TLcom Capital and Women's World Banking in 2021.<sup>67</sup>

### **COVID Impact**

COVID-19 brought enormous operational challenges for many software companies, with some facing problems servicing orders during the lockdowns. But it also allowed agriculture companies to take advantage of their position within an essential sector to develop new revenue streams. In Nigeria, **Farmcrowdy**, which had previously focused on serving farmers and wholesale markets, launched Farmcrowdy Foods in 2020 to reach the retail market and start deliveries directly to consumers. According to Farmcrowdy's founder, Onyeka Akumah, "Having to deal with lockdown was difficult, but because food is an essential service it also allowed us to get a license to move food items."<sup>68</sup>



## CASE STUDY: Farmcrowdy

Farmcrowdy's tech-driven model has rapidly created a network of 425,000 farmers, who are able to access inputs, education, and finance early in the planting season, increasing yields and incomes.<sup>69</sup>

Onyeka Akumah (*below left*), a serial entrepreneur from Nigeria, developed the idea for Farmcrowdy as a way to address challenges in the Nigerian agricultural sector through technology. He identified three challenges facing Nigerian farmers: access to market, inputs, and technical expertise. Akumah attended university in India and had a background in information technology, e-marketing, and online travel. Because he wanted to build a founding team with experience in other domains, he approached Ifeanyi Anazodo, a former brand consultant; Akindele Philips, who had a background in accounting; Christopher Abiodun, a computer programmer; and Temitope Omotalani, a local farmer with extensive knowledge of the Nigerian agricultural sector.

The team co-founded Farmcrowdy in 2016 with Akumah as CEO. The company's original structure was based on a crowdfunding model, with sponsors from the general public investing in a range of farm cycles. The farmers also received advice and training in better agricultural practices and production methods, as well as market access. At the end of the farm cycle, the profit would be split 40:40:20 between the sponsor, the farmer, and Farmcrowdy, once

the initial investment had been repaid. In the first year it connected around 2,000 smallholder farmers with 1,000 sponsors.<sup>70</sup>

Farmcrowdy benefited from a \$1 million seed round from a group led by Techstars Ventures, which was drawn to the company via existing interest from local investors.<sup>71</sup> Akumah believes that "local investors are important because they give validation for what you're doing as a business, which helps in gaining international funding." This allowed the company to start investing in an app, as well as to bring on board more agricultural experts and expand its reach. Farmcrowdy expanded its portfolio of farmers rapidly because it focused on reaching out to farming cooperatives and community leaders to source farmers and ensured an easy user experience for its app.

Farmcrowdy has restructured as it has grown, enabling it to focus on more aspects of the food value chain. For this process, Akumah understood that mentorship would be crucial. "Capital to grow a business goes beyond cash — it also goes into mentoring. I had very good mentors around me who were instrumental in helping me decide how to restructure Farmcrowdy last year, as I hadn't done any of that before." In 2019 Akumah created a holding company, EMFATO, that had two businesses: Farmcrowdy, which specialized in technology for agriculture without crowdfunding; and Crowdyvest, the crowdfunding arm.

Farmcrowdy's agility, and the technology it has brought to bear on the agricultural sector, helped the company to win some





large contracts during the COVID-19 lockdown. According to Akumah, “As Farmcrowdy was already building technology around providing finance for agriculture, we were able to get some of the biggest partnerships who had farmers’ business, including the federal government. They were happy to onboard the farmers into our network such that the farmers that were supplying them were now doing so through the Farmcrowdy network.”

By early 2021, the company had a network of 425,000 participants in the food value chain in all of Nigeria’s 36 states, having deployed over \$15 million in farming projects over the previous three years.<sup>72</sup> Farmers that are part of the Farmcrowdy network speak of the importance of obtaining good quality seeds and other inputs early in the farming season, as well as finance to

enable them to invest in equipment and hire laborers. Such factors help to improve yields and incomes for the farmers.<sup>73</sup> In the future, Farmcrowdy seeks to expand beyond Nigeria, while continuing to strengthen their network within the country. Meanwhile, Akumah has also taught at a local business school in Nigeria and mentored emerging entrepreneurs, connecting them to Techstars and other programs.

## SEGMENT 2 — INCREASING YIELDS AND REDUCING COSTS

Invention-based enterprises are companies that have successfully developed an original product. In agriculture, IBEs are creating solutions that improve food production and thus help address food security problems and poverty. This profile shows how their innovations are transforming the nature of agriculture in sub-Saharan Africa and India. The characteristics of IBEs — and their founders — differ in some important ways from those of software and business process companies.

### Company Characteristics

Agricultural IBEs often focus on high-tech physical solutions for crop protection and production, clean energy provision, efficient irrigation, and storage. IBEs in this sector seem to be much more prevalent in India than in sub-Saharan Africa, with nearly three-quarters of the agricultural IBEs surveyed based in the former geography.

### Founders' Early Careers and Educational Backgrounds

A high level of specialized education is typical of IBE founders, who have often earned advanced academic degrees in cutting-edge fields such as space technology, computer science, and solar energy. Many are returnee entrepreneurs, having originally grown up on farms or in rural areas, which gave them some early knowledge of farming. In addition, the founding teams of Indian IBEs are larger, on average, than African IBEs; the latter often had only one founder.

A common pattern across the IBE founding teams studied for this report was that co-founders met in a university context, for instance working on project for a Stanford class or a business competition at New York University. Some Indian founders also developed their IBE ideas at local universities, either for a competition or thesis project. In all these cases, the founding teams made use of the university's resources and received guidance from its experts when developing their products. These academic-based experiences were then used as the basis for pilots with actual customers.

### Startup Phase

IBE founders face compounded uncertainties of operating in the agricultural sector and building new inventions. The nature of their products means that their businesses can be inherently costly and risky. Agricultural IBEs find it more difficult to access customers, capital, and managers, but their educational backgrounds mean that they find it easier to gain access to engineers and mentors, when compared to business process and software companies in the sector.

Endeavor Insight's research shows that agricultural IBEs take longer to grow to 10 employees than IBEs in other sectors. Based on founder interviews, it seems that this is likely due to investors being less interested in agriculture, as well as the seasonal nature of crop planting cycles limiting the pace of growth. IBEs in general face more difficulty accessing capital than other types of companies because of the challenge of building workable prototypes and convincing investors (and users) that their inventions are viable products. By definition, they are creating a new and innovative product, so they face a greater challenge than other company types in demonstrating market viability. Difficulty in raising startup capital leads many founders to make use of bootstrapping or working capital, while some reported that running pilot projects, increasing customer use testimonials, and giving demonstrations to investors helped to remove barriers to grants and other capital.

IBE founding teams are often strong in technical fields, such as engineering,



so they benefit from business support during the startup phase. Many founders mentioned the useful skills they gained from accelerators and incubators, especially customer research, business development, and marketing. However, some support programs prove unsuitable for IBEs because the support program staff rarely have firsthand experience with these types of companies. This means that the program curricula fail to appreciate the complexity of their product and the intricate demands of testing and preparing for the market. The mentors in such programs mainly consist of outside investors, so their programming is skewed towards fundraising instead of other, wider concerns around the business.

### **Growth and Expansion Phase**

For growth and expansion, agricultural IBEs can struggle to access their desired market and reach smallholder farmers, who often find new technologies unaffordable. When combined with potential bureaucratic hurdles in complying with changing regulations and obtaining permits to import components, this leads to a slow rate of adoption by end users. IBEs that partner with larger customers who are less price sensitive and more concentrated in the sector, such as aggregators and farmer cooperatives, may stand a better chance of success than those that only target their innovations at individual farmers. This was the case with **CoolCrop**, an India-based company specializing in cold storage.

Successful IBE founders assemble technically qualified teams, drawing on contacts, universities, and business competitions, and by hiring C-suite level individuals for managing their growth to new markets. Several IBEs that have expanded internationally mentioned that they participated in a support program that had a specific focus on assisting founders with market experimentation and expansion. The successful IBEs that have expanded to multiple countries provide solutions that address food security by lowering costs and increasing yields. These same benefits apply to smallholder farmers growing cash crops, helping to alleviate poverty. A notable example is **Agventures**, an agricultural inputs and equipment manufacturer, exporter, and consultant, which was launched in India in 2012 and has since expanded to four countries in Africa.

### **COVID Impact**

The onset of the COVID-19 pandemic had an immediate effect on many IBEs. In some cases, R&D had to be postponed due to the closure of lab facilities and the halt in international travel, resulting in significant losses. For example, the founder of one IBE experienced a year of delays in product development, but has worked on increasing R&D at a local facility instead of one abroad. Despite such setbacks, the crisis also led some government departments to seek partnerships with those IBEs that could offer a reliable route to ensuring food security.

## SEGMENT 3 — JOB CREATION AND SCALE

Business process companies are the most likely of the three segments to successfully scale to 50 or more employees, so they are most closely associated with addressing job creation. They had an average employee size of 97, compared to 62 for IBEs and 54 for software companies, where data was available. The profile below of their founding teams and business model shows how they differ from the other two innovative company segments in meaningful ways.

### Company Characteristics

Business process innovators are particularly well suited to providing a large number of jobs at their companies, primarily because they operate on the ground by facilitating the exchange of goods and services to customers. These companies often adapt existing technology to drive incremental innovations — such as supplying food through specific value chains, serving as distributors/vendors, and providing transportation and logistics services.

Across the three company segments, business process companies are the oldest, with an average age of almost 10 years, compared to eight for IBEs and six for software companies. Data on the top-performing agricultural business process companies within the dataset — those that have reached a significant scale of 100 or more employees — showed that African and Indian companies are roughly equally represented.

Business process companies are more likely to have connections to institutional investors and support organizations than to angel investors or grantmakers. The relatively lower reliance on angels and grantmakers is likely attributable to business process companies' higher average age, as they have had more time to establish themselves.

### Founders' Early Careers and Educational Backgrounds

Founders of business process companies primarily hold degrees in business and have professional experience at prominent corporate firms. The majority of founding

teams had at least one person with a business degree and previous work experience at one of the 1,000 largest public firms in the world, according to Forbes.\* For example, the co-founder of **Ergos** worked as a banker at Barclays before developing his business idea, which combines warehousing and banking.<sup>74</sup> Ergos is an Indian firm that has built a network of over 100 “micro-warehouses” to store and aggregate grain produced by smallholder farmers, while digitizing data and providing them with market access.<sup>75</sup>

### Startup Phase

When starting up, business process companies often face logistical issues, especially when they are involved in procuring, transporting, and delivering goods. Some founders spoke of challenges in securing the capital needed to buy factories or invest in equipment. When they turned to working capital instead of taking on debt, it inevitably slows the growth of the company.

In addition to the challenge of capital, it can take substantial time and effort for companies to build trust among farmers and convince them to try out the new systems that they are offering. Then training the farmers to use the systems is another time-consuming process. As a result, many have found it valuable to partner with foundations, organizations, or community-led co-operatives that have already established relationships with communities of farmers. This enables the business process companies to build a customer base of farmers more rapidly.

\* Data taken from Forbes' Global 2000 list of the world's largest public companies, available at [forbes.com/lists/global2000](https://forbes.com/lists/global2000).



Business process founders in agriculture are often highly educated, with contacts from previous employment at private sector multinationals. However, they still report greater difficulty in accessing mentors than founders of the other two company types. Support organizations such as Villgro have also been useful in helping to connect business process founders to mentors and investors in the early stages.

### **Growth and Expansion Phase**

Because business process companies deal with multiple actors across the food value chain, they have to be highly attentive to government regulations and licensing requirements, particularly when they are looking to grow. Founders report that the lack of qualified managers who can account for factors like these constrain their growth plans.

Without the right talent to put systems and processes in place, rapid growth can also create problems, so some business process founders are deliberately moderate in their pace of expansion. This is where

appropriate investment can be useful. One company to have successfully used capital to drive scale is **EthioChicken**, which raised finance from Acumen and Finnfund specifically to fund its business expansion.<sup>76</sup> The company now has over 500 employees.

### **COVID Impact**

Business process companies have been more affected by COVID-19 than other innovative agricultural businesses, because of their greater reliance on in-person interactions and need for staff. The pandemic made several business process companies pause their expansion because of stalled fundraising rounds. Some took the opportunity to update their processes, and move to digital systems, which should see them emerge stronger and better positioned to grow once markets normalize.



## CASE STUDY: Babban Gona

Babban Gona aims to “create an economic buffer to halt the spread of insecurity by unlocking the power of agriculture as a job creation engine.”<sup>77</sup>

Babban Gona was founded in 2012 by Lola and Kola Masha (*below left*), Nigerian returnees with combined experience that includes advanced degrees from MIT, Harvard, and the University of California-Berkeley, as well as previous jobs at the multinational firms General Electric, Google, and McKinsey. The founders were motivated by a desire to halt the spread of instability in the poorest rural areas of Nigeria and realized they could contribute to that through job creation in agriculture, given the sector’s lower skill requirements. They founded Babban Gona with a mission to “inspire and enable hardworking smallholder farmers to reach their full potential.”<sup>78</sup>

The company’s agricultural franchise model is designed to allow farmers to benefit from economies of scale. Babban Gona identified poor economies of scale as one of the main issues that held smallholder farmers back in a market characterized by land fragmentation,

poor access to finance and markets, inadequate cash flow, and a lack of training services. That is also why the company focuses on the maize and rice value chains, two staple crops that involve the greatest number of farmers. Babban Gona’s holistic approach provides financial services, inputs, training, and marketing services to aggregated groups of farmers, which helps reduce the risk of lending to smallholders.

Early-stage partners including USAID, the Gates Foundation, and the Alliance for a Green Revolution in Africa have provided funding since 2012 to help the Mashas set up the company. In total, the company has raised tens of millions of dollars through a blended finance strategy, with a conscious effort not to depend on grants.

Good planning and an early focus on digitalization helped fortify the company against the impacts of the COVID-19 crisis. As Babban Gona’s Head of Partnerships, Ubong Inyang, recounts, “Disruptions within the supply chain were the main challenges, with our suppliers facing hold-ups of inputs coming in from China, and then backlogs at the ports in Nigeria. I credit Kola for using his experience of the previous five years to start planning for the 2020 season three months earlier than most companies, in December 2019. That meant that we had contracts with our suppliers in place. The planting season starts in June, and by April we had brought in all of the inputs for the season.”

Transitioning to remote work brought its challenges, but Inyang points to their existing systems that helped the company adapt quickly. “To a large degree, we were already accustomed to working remotely.



In 2019 we were able to digitalize 99 percent of our field operations. Before, almost every aspect of our operations for farmers — selection, training, field mapping, input distribution, plant monitoring — had to be done manually, but in 2019 we had built tools to do all of that digitally.”

Babban Gona is dedicated to continually increasing the value it provides to farmers, and this strategy was behind the early push for digitalization. According to Inyang, “We were thinking about how we could use technology to scale our operations and remain efficient. That led to the commencement of digitalization.” As a result, even after COVID-19 hit, the company had the capacity to remotely manage its operations across six states and with over 2,000 workers, including field teams.

Nearly a decade since its founding, Babban Gona has served some 200,000 individuals, and employs over 2,000 part-time and full-time workers. In 2020 the company created over 82,000 jobs in agriculture, 70 percent of which employed young people and a third of which employed women. This underscores one of the company’s objectives to “create an economic buffer to halt the spread of insecurity by unlocking the power of agriculture as a job creation engine.”<sup>79</sup> In terms of individual impact, the credit and training that Babban Gona provides helps farmers to increase both yields and area harvested, enabling further investment in both inputs and machinery. One farmer, interviewed by Babban Gona, saw the maize yield on her one-hectare farm increase by 50 percent in a single year, allowing her to buy a grinding machine and a cow.<sup>80</sup>



Babban Gona set out to reach one million smallholder farmers by 2025 and is pursuing a dual track growth strategy towards that goal. Inyang explains, “We’re looking to adapt our business model to allow some of our more experienced farmers to move further up the value chain, to move away from just production to some form of processing. We’re also looking for partnerships that would help us create value for the farmers along other lines, particularly in education, healthcare, and housing.”

## IV. Entrepreneurial Networks

Entrepreneurial networks, such as value chains and support systems, have various features that impact the success of individual companies.



# VALUE CHAINS

## **Entrepreneurship evolves differently within value chains, as exemplified by the Kenyan macadamia nut and Nigerian maize sectors.**

The value chains within which agriculture companies operate provide another lens for understanding how businesses grow and maximize impact. For this study, Endeavor Insight selected two prominent value chains for comparative analysis — macadamia nuts in Kenya and maize in Nigeria. Both Kenya and Nigeria are home to high levels of agricultural production by smallholder farmers and entrepreneurial activity in agriculture.<sup>81</sup> Agriculture is an essential part of each country's economy, in terms of employment, income, and food security.

Kenya is home to around 16 million smallholder farmers in a population of over 53 million, more than three-quarters of whom make some part of their living in agriculture. Kenya lacks a heavy industry of the size of Nigeria's oil and gas sector, meaning that agriculture is proportionately more important to its national economy, accounting for over one-third of the country's GDP.<sup>82</sup>

Nigeria has approximately 66 million smallholder households, 72 percent of whom are living below the poverty line. Half of these households comprise rural workers and subsistence farmers, according to the Rural and Agricultural Finance Learning Lab.<sup>83</sup> Around 36 percent of the total are classified as commercial farmers, with the remainder being micro and small agricultural enterprises. Overall, agriculture represents 20 percent of the country's GDP.<sup>84</sup>

In both Kenya and Nigeria, the agtech sector — which focuses specifically on applications of technology to agriculture — and entrepreneurship as a whole are rapidly growing. Kenya and Nigeria are the top two agtech markets in Africa, and along with Ghana, they accounted for over 60 percent of agtech startups in all of Africa

in 2018.<sup>85</sup> In terms of tech startups across all sectors, Kenya and Nigeria are also two of the top three largest recipients of tech investment in Africa. In 2020, Kenya raised \$231 million from 78 deals, while Nigeria raised \$270 million from 124 deals.<sup>86</sup>

## **Kenya's macadamia nut value chain is export-focused, with entrepreneurial enterprises concentrated in upstream activities and downstream processing.**

The Kenyan macadamia nut industry represents an export-oriented value chain that has a strong presence of upstream companies. Kenya is now the world's third largest producer of macadamia nuts, behind Australia and South Africa. The Kenya value chain is characterized by targeted production, as 95 percent of the produce is exported, mainly to Western and Asian countries.<sup>87</sup>

The crop was originally introduced in the 1940s from Australia, and widespread production began in the 1970s, with frequent intercropping with coffee.<sup>88</sup> Before 2005, the industry was semi-monopolistic, being dominated by the government-linked **Kenya Nut Company**.<sup>89</sup> In the years since then, many entrepreneurial actors have entered the value chain. In an effort to maintain Kenya's position throughout the production value chain, the government has required the processing of nuts to take place within Kenya since 2009, which has increased focus on processing.<sup>90</sup>

Until the COVID-19 pandemic struck in 2020, global demand for macadamia nuts had been rising, particularly from the West and Japan, which encouraged more Kenyan farmers to start growing macadamia nuts. Local production of macadamia nuts-in-shell increased almost fourfold between 2009 and 2018, from 11,000 tonnes to 42,500 tonnes, with around 200,000 farmers growing the crop.<sup>91</sup> Along with tea, macadamia is one of Kenya's most lucrative cash crops, but Kenyan

macadamia farmers continue to receive lower prices than those in other countries, and demand continues to outpace supply.<sup>92</sup>

The bulk of Kenya's entrepreneurial activity in the macadamia nut value chain is concentrated in the upstream section, as illustrated on the opposite page. Upstream companies serve the highest average number of smallholder farmers in the value chain, providing improved inputs and clean energy sources. Their business focus helps increase efficiency in production and reduce costs for the livelihood-sustaining enterprises of farmers.

Because the macadamia industry is highly export-focused, production and processing are prioritized ahead of smallholder farmers' business operations. Downstream processors, which buy produce from farmers, represent one-fifth of the entrepreneurial companies in the value chain. There is a relative shortage of midstream companies, which provide farmers with formal access to essential services, such as finance, insurance, transportation, and marketplaces. With fewer midstream companies in the value chain, smallholder farmers have fewer opportunities for services that would improve their yields and incomes.

The government's significant involvement in the macadamia industry and its nature as an export crop pose challenges for the future development of entrepreneurial companies. Major government interventions like the requirement of domestic processing influence where and how entrepreneurs can enter the sector.

**Nigeria's maize value chain is centered on production for domestic consumption, with a strong presence of midstream entrepreneurial companies.**

The Nigerian maize industry represents a local-oriented value chain and has a strong presence of midstream companies. This value chain is characterized by large-scale production for multiple purposes,

especially domestic consumption because maize is a staple crop.<sup>93</sup> Maize was introduced to Nigeria in the sixteenth century by the Portuguese, who brought it over from the Americas, and it has become a major part of the Nigerian diet.

The smallholder farmers in Nigeria who grow maize contribute to national production of 12.7 million tonnes in 2019.<sup>94</sup> Nigerian smallholder farmers generally only sell one-quarter of their agricultural produce, with most being consumed by their own household.<sup>95</sup> Maize that is not destined for direct consumption is used as an input for many products in other value chains, such as ethanol and feed for livestock.<sup>96</sup>

The most entrepreneurial activity in the Nigerian maize value chain is in the midstream sector, which serves the largest number of smallholder farmers. These midstream players help farmers by cutting out middlemen and reducing transaction costs, thereby increasing incomes.

Government intervention that is meant to be protective of the maize industry has uncertain implications. In 2020 the government banned maize imports, with the aim of boosting domestic production during the COVID-19 pandemic.<sup>97</sup> Such a protective move was supported by some farmers, but critics claim that the ban caused shortages, and the government had to make a few temporary exceptions to maintain supply.<sup>98</sup> Nigeria is already a net importer of food, and local production capacity is not at a level to support such a ban. For the government's strategy to succeed, there will need to be greater support of upstream companies to provide inputs and equipment, as well as of midstream companies to support logistical and other services.

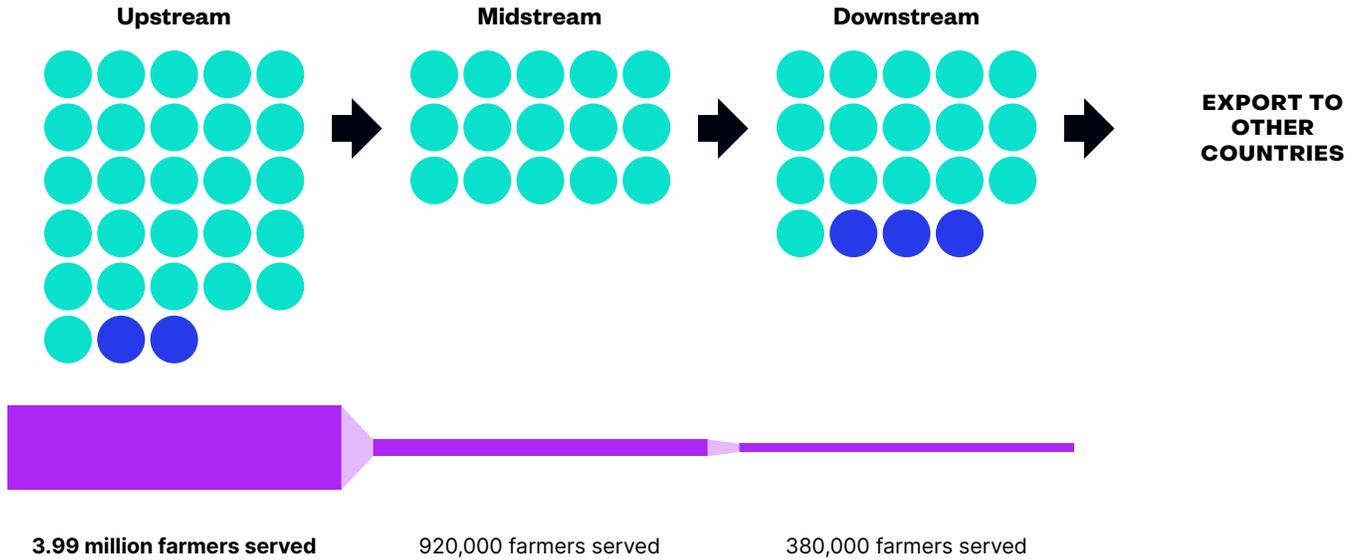
## COMPARING VALUE CHAINS AND THEIR IMPACT ON FARMERS

Each circle represents a company that participates in the respective value chain. Companies positioned in different sections of each value chain have divergent impacts on farmers, as indicated by the aggregate number of farmers that they have collectively served below the purple ribbon.

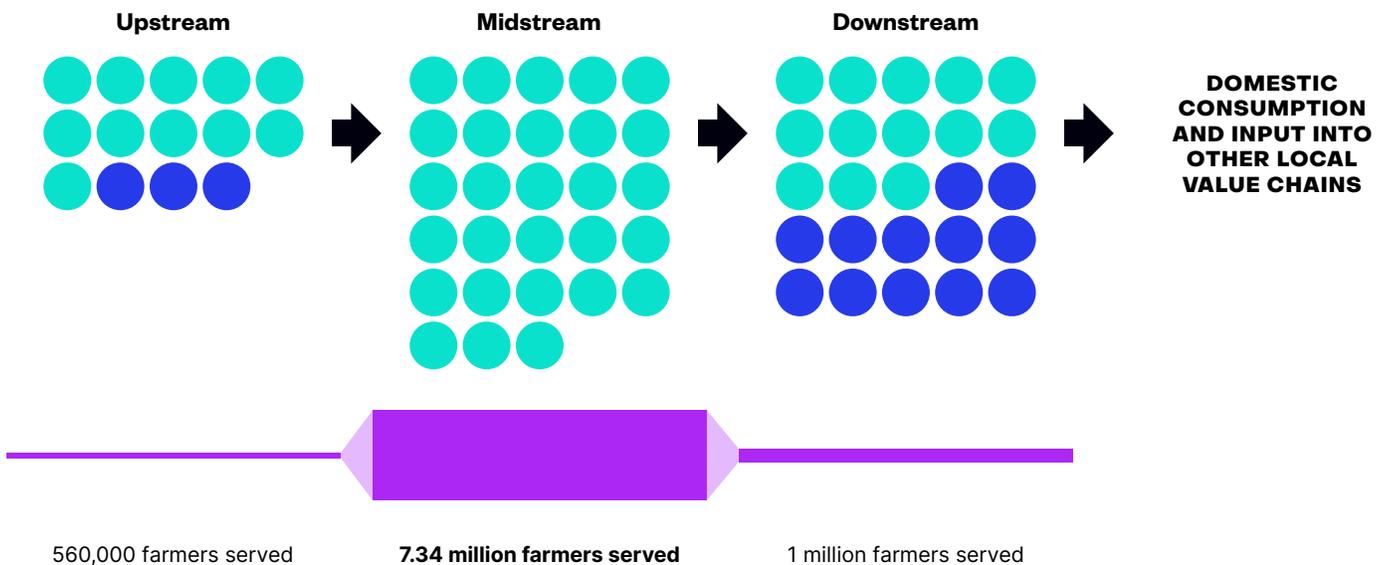
● ENTREPRENEURIAL COMPANY ● NON-ENTREPRENEURIAL COMPANY



### KENYA'S MACADAMIA VALUE CHAIN



### NIGERIA'S MAIZE VALUE CHAIN



Note: Data includes companies operating in the Kenyan macadamia and Nigerian maize sectors. Non-entrepreneurial companies include input providers, processors, and wholesalers. The aggregate number of farmers served is based on available company-reported data.

Sources: Endeavor Insight interviews and analysis; company websites. Sample size: 129 companies.

**Lessons can be drawn by comparing these two differently structured value chains.**

Endeavor Insight examined a number of factors to better understand the patterns that differentiate the companies and founders in each value chain. Businesses operating in the Kenyan macadamia industry are commonly younger than those in the Nigerian maize value chain, with an average age of 12 years, as opposed to 18 for those studied in Nigeria. Data on these companies shows that young Kenyan companies have been able to scale more quickly — companies founded there in the past 10 years employ an average of 76 people, compared to 42 for those in Nigeria's maize value chain.

Businesses in the Nigerian maize value chain have had a greater reach to domestic populations, serving an average of 556,000 farmers, compared to 189,000 for Kenyan companies in macadamia. In the former, 60 percent of the businesses are business to consumer (B2C), compared to 48 percent in the latter.

The Kenyan companies studied have raised more capital and have a greater influence from abroad. The data collected for this research shows that 31 percent of the Kenyan macadamia companies have raised capital, with an average of \$26 million, compared to 22 percent of the Nigerian maize companies, which average \$16 million. At the same time, Endeavor Insight's data showed that 64 percent of the founders in the Kenyan macadamia value chain are expats, while most founders in the Nigerian maize value chain are returnees.

As the visualization on the next page shows, the companies in the Kenyan macadamia sector that receive the most resources and services are expat-led companies. On the other hand, such companies in the Nigerian maize sector are primarily returnee- or local-led.

The popularization of mobile banking through MPESA after 2007 greatly influenced the development of Kenyan software companies across all sectors, and also led to a surge in foreign involvement in the local ecosystem.<sup>99</sup> Founders in the macadamia value chain are more likely to need pre-existing relationships with foreign actors to succeed in establishing their businesses, and this influx of outside interest created a barrier to entry for local entrepreneurs who may lack such connections. There are recent signs of improvement in this regard, as tech-related startups in Kenya are proliferating.<sup>100</sup>

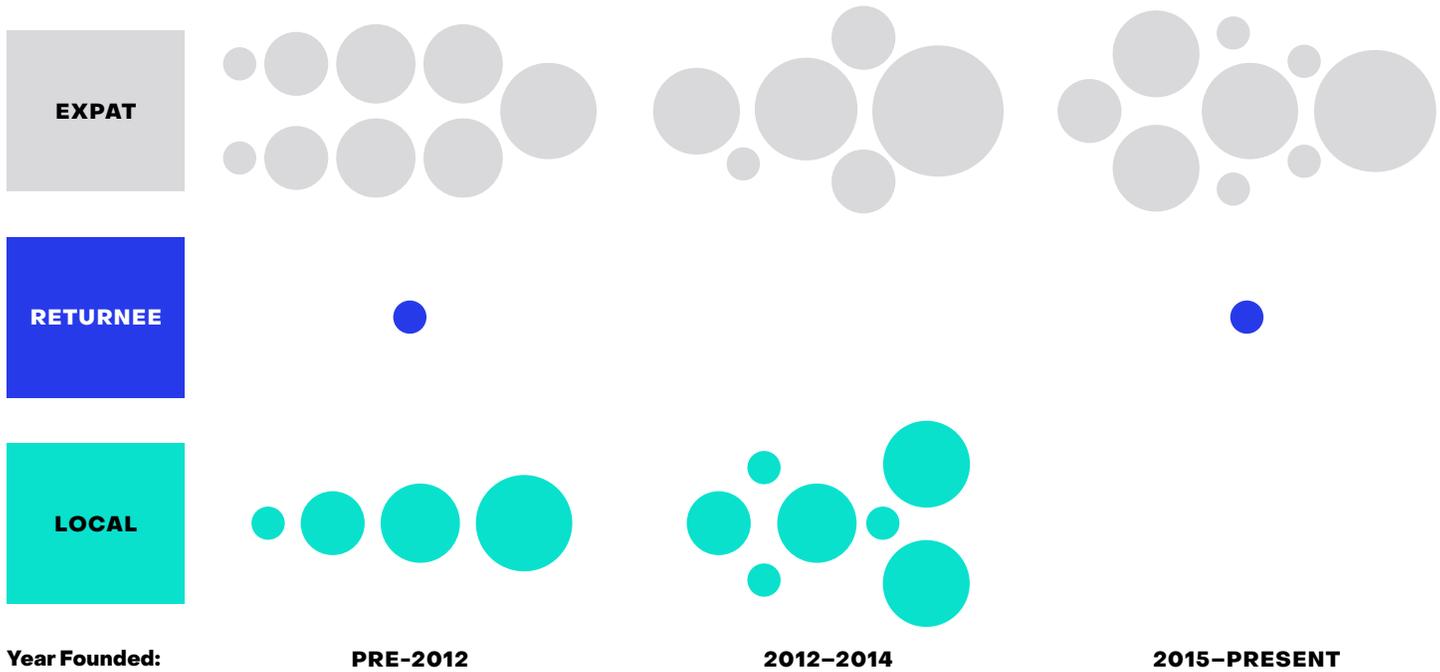
These findings have implications for the differences between export-oriented and local-oriented value chains. Because the midstream section of the value chain directly provides services to farmers, it has a greater impact on the success of individual farms. It is this direct engagement, which avoids middlemen, that enables them to have the greatest impact. This section is relatively more developed in the Nigerian maize value chain than in the Kenyan macadamia value chain.

This difference can be viewed in the context of the nature of the two value chains: Kenyan macadamia, being export-focused, has strong connections to foreign capital and mentorship, which may be beneficial for scaling, but not for building linkages to local actors like farmers. In contrast, domestically focused value chains with more local or returnee founders, such as Nigerian maize, succeed more in social impact, but need more assistance accessing capital.

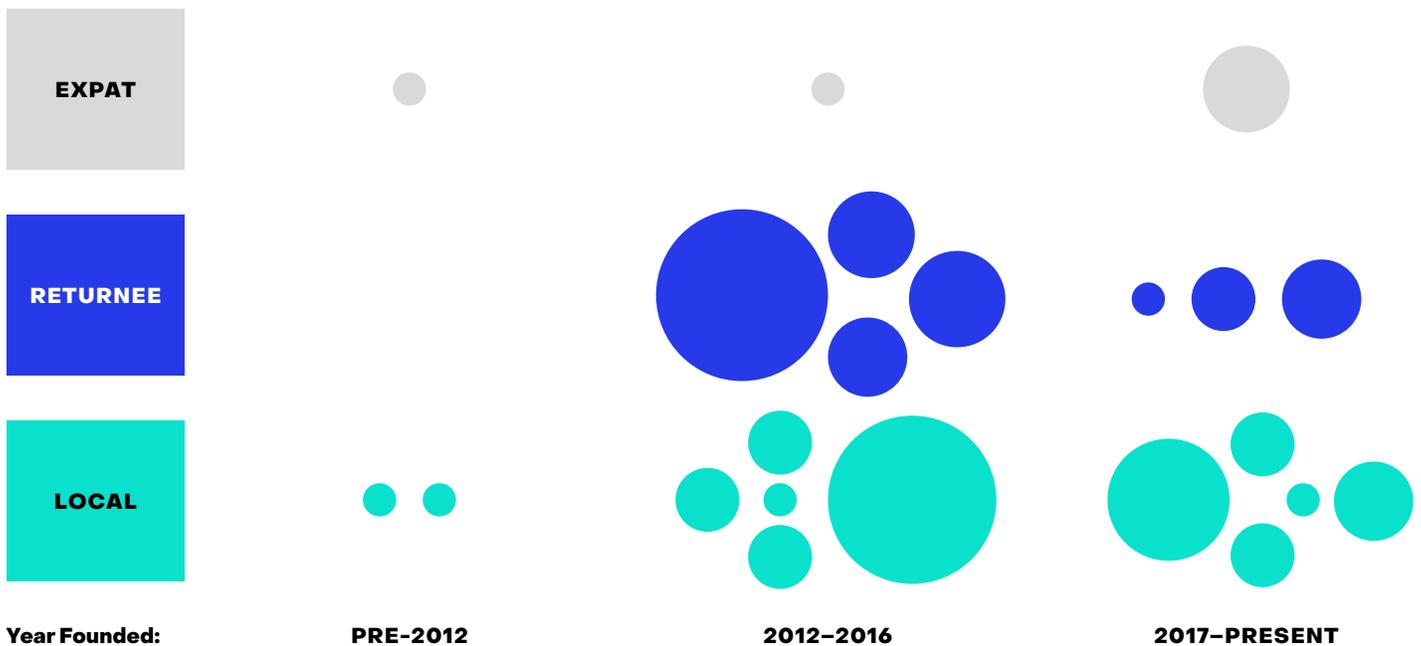
## FOUNDING TEAM BACKGROUNDS AND CONNECTIONS IN EACH VALUE CHAIN

The size of the circle is proportionate to the resources a company received including mentorship, investment, and other support.

### Most Well-Connected Companies in Kenyan Macadamia are Expat-Led



### Most Well-Connected Companies in Nigerian Maize are Local- or Returnee-Led



Note: Companies were included if they received resources or services from at least one mentor, support organization, or investor. Each bubble represents a company, and its size is proportionate to the number of relationships it had with those providers. Empty sections indicate the absence of companies with investment or support relationships. Founding teams are defined as "local" if they have no expat or returnee co-founder, "returnee" if they have at least one returnee but no expat co-founder, and "expat" if they have at least one expat co-founder.

Sources: Endeavor Insight interviews and analysis; LinkedIn; PitchBook; Crunchbase; company websites. Sample size: 197 connections.

## MENTORSHIP

**High quality mentorship, particularly from those with relevant agricultural experience, can be pivotal in helping companies scale and raise capital.**

A telling feature of entrepreneurial networks is the quality and quantity of mentorship found between entrepreneurs. There is no common definition of mentorship — concepts range from informal relationships that involve ad hoc discussions to highly organized programs. Some organizations advocate for structured programs in which mentors are carefully selected and trained, such as Mowgli Mentoring.<sup>101</sup> For the purposes of this study, mentorship is defined as at least three instances of one-on-one engagement lasting 30 minutes or more to where someone advised a founder on critical business issues, and this engagement can occur independently of a support organization activity.

The quality of mentorship in a sector matters. In this study, the mentors who support agriculture companies often have relevant experience. Forty-four percent

of the mentors had previous experience in agriculture themselves, 46 percent had experience founding a scaled company, and two-thirds were currently based in sub-Saharan Africa or India. Founders recounted that they typically met mentors as angel investors and through support programs.

Looking specifically at the Kenyan and Nigerian value chains, 25 percent of companies in the Nigerian maize sector received mentorship, compared to only 16 percent of those in the Kenyan macadamia sector. Entrepreneurs that received mentorship perform better than those who do not, in terms of scaling their companies to 50 or more employees. Of the companies studied, 36 percent of mentored companies reached scale, compared to 30 percent of non-mentored companies. This was true for both the Nigerian and Kenyan value chains. In Kenya, 44 percent of companies with mentors reached scale, while only 35 percent of those not mentored did so. In Nigeria, 31 percent of companies with mentors reached scale, compared with only 21 percent of those not mentored.



► Kobo360 founders  
Ife Oyedele II (left) and Obi Ozor (above)

The data also shows an association between mentoring and the ability to raise capital. Overall, 56 percent of companies with mentors raised at least \$5 million in capital, compared to 39 percent of companies without mentors. As with scale, this was also true for both value chains. In Kenya, 75 percent of mentored companies raised at least \$5 million, compared to 47 percent of non-mentored companies. In Nigeria, 40 percent of mentored companies raised at least \$5 million, compared to 25 percent of non-mentored companies.

Some successful Nigeria-based entrepreneurs, such as the founders of **Kobo360**, **Farmcrowdy**, and **Thrive Agric**, have further contributed to their local entrepreneurial ecosystems by mentoring or investing in other entrepreneurs. In the Nigerian maize value chain, connections were 20 percent more likely to be from other entrepreneurial companies than in the Kenyan macadamia value chain, which has a greater prevalence of connections from foundations and support organizations. This indicates that

successful founders have greater relative influence in Nigeria's maize value chain than in Kenya's macadamia value chain.

Still, gaps continue to exist in the availability of mentorship for agricultural entrepreneurs in these markets. Several founders stated that the mentorship they received was not relevant to the agricultural sector, or felt too polished and unrealistic because it was not coming from people with firsthand experience. Others identified a culture of distrust within the entrepreneurial community, causing a lack of willingness of founders to share their experiences.



▼ Farmcrowdy founder  
Onyeka Akumah



## CASE STUDY: Stellapps

Connections from education and prior work experience gave Stellapps a strong network of mentors, who were invaluable in helping the founders grow the company.<sup>102</sup>

The five co-founders of Stellapps (*below*) have extensive experience in computer science and engineering, including some who gained international experience before returning to their home country. Ranjith Mukundan, Ramakrishna Adukuri, Venkatesh Seshasayee, Ravishankar Shiroor, and Praveen Nale met while working together at Indian IT company Wipro. Between them, they had work experience across Europe, the United States, and East Asia in developing Internet of Things (IoT)\* solutions for home automation.

They aimed to use their technical backgrounds and experience in IoT to solve a compelling problem in sectors such as healthcare and agriculture. On the advice of a friend who worked in the dairy industry,

they focused on tech-based solutions for that sector in India, and in 2011 launched Stellapps as a technology company. The company applies state-of-the-art mechanization tools that leverage IoT, big data, cloud mobility, and data analytics across the dairy supply chain. Through the use of these tools, milk quality and quantity is monitored and recorded at each stage, creating greater transparency in the value chain. According to Mukundan, this “allows for farmers to not be taken advantage of by agents that run these centres, and leads to an increase in income for them.”

The initial challenges for the founders included raising capital and developing an understanding of agricultural supply chains. A connection with the Indian Institute



\* Internet of Things (IoT) describes systems by which physical devices connect to the internet to share data and communicate with a network without involving human interaction.

of Technology at Madras (IIT Madras), Shiroor and Nale's alma mater, served as a route to access mentors, government grants, and angel investors, which proved crucial to the company's growth.

The company was incubated at IIT Madras, where the team met Professor Ashok Jhunjunwala, one of the company's earliest and most influential mentors. Jhunjunwala had served on the board of several companies and was able to offer the founders practical, industry-specific guidance. Mukundan explains, "He offered us advice about how to build a business in its initial days, and showed us why unit economics [analyzing profitability at the unit level] was important, and that we cannot be focused on just R&D."

Jhunjunwala in turn connected the founders to scaled entrepreneurs within his own network, including M. M. Murugappan, the Vice-Chairman of an Indian conglomerate, the Murugappa Group. Murugappan offered the founders advice on how managing the business would change as it scaled. He taught them that they could not wait to achieve scale, but that they had to actively plan for it. Murugappan was also responsible for connecting Stellapps to their first customer.

Understanding the value of mentorship, the founding team tapped further into their professional networks, seeking advice from an experienced C-suite executive from Wipro on building the company with a long-term vision. A former customer of Wipro helped the founders with their operations and shared inputs on building an initial network based on his experiences at Airtel. Mukundan relates that not only were these mentors fundamental in helping the founders navigate business, but they also provided connections to customers, angel investors, and other mentors. "There was a cumulative effect of talking to multiple people who we were



referred to by these initial mentors. The problem we were attempting to solve was not a cookie-cutter problem, and we were trying to harvest as many perspectives to see which would work for us."

Stellapps has impacted 2 million farmers across 35,000 villages in India, and the company's tools handle 11 million liters of milk per day. Looking ahead, Mukundan has high aims for Stellapps. "We'd like to become the tech-first, data-driven, digital commerce service provider. What we're trying to do is to see if we can become the de facto Amazon for the dairy supply chain, from the consumer through to the farmer."

## SUPPORT ORGANIZATIONS

### **Support organizations provide important resources, but are not sufficiently tailored to the needs of the agricultural sector.**

The agriculture companies in this study participated in more than 150 support organizations including incubators, accelerators, and other programs. These programs provided business training, as well as networking with professionals and formal mentorship opportunities.

Founders reported mixed experiences when participating in support organization programs, but consistently noted several aspects that were valuable. Organizations that offered access to funding and networks were seen as the most helpful. Peer-to-peer networking is also viewed as worthwhile, as it enables entrepreneurs to bounce ideas off each other and cement new partnerships. Such connections can in turn lead to mentorship and new funding opportunities. Founders valued how support organizations could help them create better business plans and appreciated guidance on running the “day to day” aspects of a business.

Agriculture companies that participated in a support program were more likely to raise capital and slightly more likely to reach the scale of 50 or more employees. Sixty-seven percent of agriculture companies that had participated in a support organization also raised capital, whereas only 49 percent that had not participated also secured capital. These findings align with research from Global Accelerator Learning Initiative (GALI).<sup>103</sup>

### **Founders of agriculture companies report limitations in several aspects of support programs.**

Founders reported that support organization programs were not tailored to the needs of the agriculture sector. For example, one founder cited a lack of consideration for value chain dynamics and for multi-country

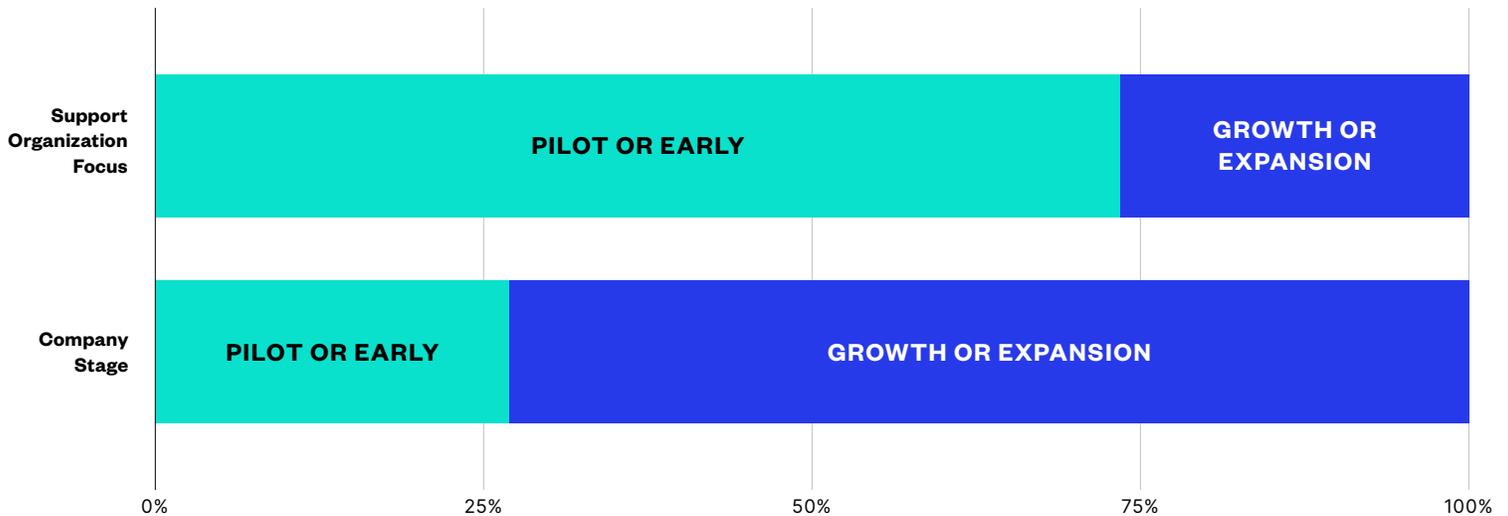
expansion, while another mentioned that their program did not factor in crop cycles. Additionally, founders of agricultural IBEs remarked that support programs did not fully consider the intricate demands and longer gestation period for testing physical products, storing them, and preparing them for market. This resonates with research by GALI, which found that only 9 percent of accelerators focus on the agriculture sector, likely because the accelerator model was initially built for the tech sector and has not been adapted enough for agriculture.<sup>104</sup>

There are systems-level gaps in what support organizations are currently offering agriculture companies. The graph on the next page shows that while many programs focus on helping agriculture companies at early stages, relatively few assist with growth and expansion strategies. Of the 145 support organizations supporting the sector, 120 served the pilot or early stage, while 43 served the growth or expansion stage. (Many organizations serve companies at various stages.) On the other hand, Endeavor Insight found that a large majority of entrepreneurial companies were at the growth or expansion stage — 122 out of 167. This suggests a discrepancy between the resources available in the ecosystem and the existing needs of entrepreneurs.

While support organizations frequently incorporate curricula or activities to help founders raise capital, access to talent is less often addressed despite it being the second highest ranked challenge noted by founders in this study. Endeavor Insight analyzed data on the most common support organizations, those that had supported at least two agriculture companies. Only 31 percent of them run programs that are explicit on their websites about assisting entrepreneurs with access to talent.

## COMPARISON OF SUPPORT ORGANIZATION OFFERINGS AND COMPANY STAGE

Support organizations tend to focus more on the earlier stages, whereas more companies are at the later stages of growth.



*Note: Data on support organizations includes those that served at least one agriculture company in the study. These categories were not mutually exclusive, as some support organizations supported more than one stage. Out of the 145 support organizations that supported agriculture, 120 supported the pilot or early stage, while 43 supported the growth or expansion stage. Agriculture companies were categorized as being at the pilot or early stage if they were 0-4 years old or at the growth or expansion stage if they were 5 or more years old. This data was mutually exclusive and included 167 companies, of which 45 were at the pilot or early stage and 122 at the growth or expansion stage.*

*Sources: Endeavor Insight interviews and analysis; LinkedIn; PitchBook; Crunchbase; support organization websites. Sample sizes: 145 support organizations and 167 companies.*

Support organizations are especially lacking when it comes to helping recruit managerial talent, which is one of the most important needs for agriculture companies that are looking to grow.

Geography is another factor that limits agriculture companies' access to support organizations, particularly in sub-Saharan Africa, which has far fewer local organizations than India. Data from this study shows that while 55 percent of Indian agriculture companies participated in a locally based support program, only 22 percent of companies in sub-Saharan Africa did so. Further, only one out of the top 10 most common support organizations that founders participated in was headquartered in sub-Saharan Africa. While the largest support organizations do have affiliate offices in several markets, they are not as attractive to agriculture companies as locally based support organizations because the latter can foster linkages across their own value chain.

There has been some movement to provide more local entrepreneurial support in Africa. For example, the African Leadership Academy was founded in South Africa in 2004, and is addressing existing gaps in the continent by providing a local pipeline to train young entrepreneurs.

Founders' complaints about the lack of specialized knowledge in some support programs align with findings from a 2018 Spring Impact report, which highlights the greater need for tailored, technical assistance for small and growing businesses in current support efforts.<sup>105</sup> If support organizations remain poorly acquainted with the agricultural sector and local context, then the businesses that they support will be poorly equipped to scale up and serve smallholder farmers.

# FOUNDING TEAMS

## Local founding teams face greater challenges than teams with expats or returnees.

The composition of founding teams can play a significant role in the trajectory of entrepreneurial companies. As demonstrated in the preceding sections, the initial spark of the business idea and ability to attract resources, or to defy market constraints, depend on the abilities and relationships that founders possess. Underlying these findings is a systemic feature of these networks — teams made up of all-local founders can face more limited resources than founding teams with at least one expat or returnee.

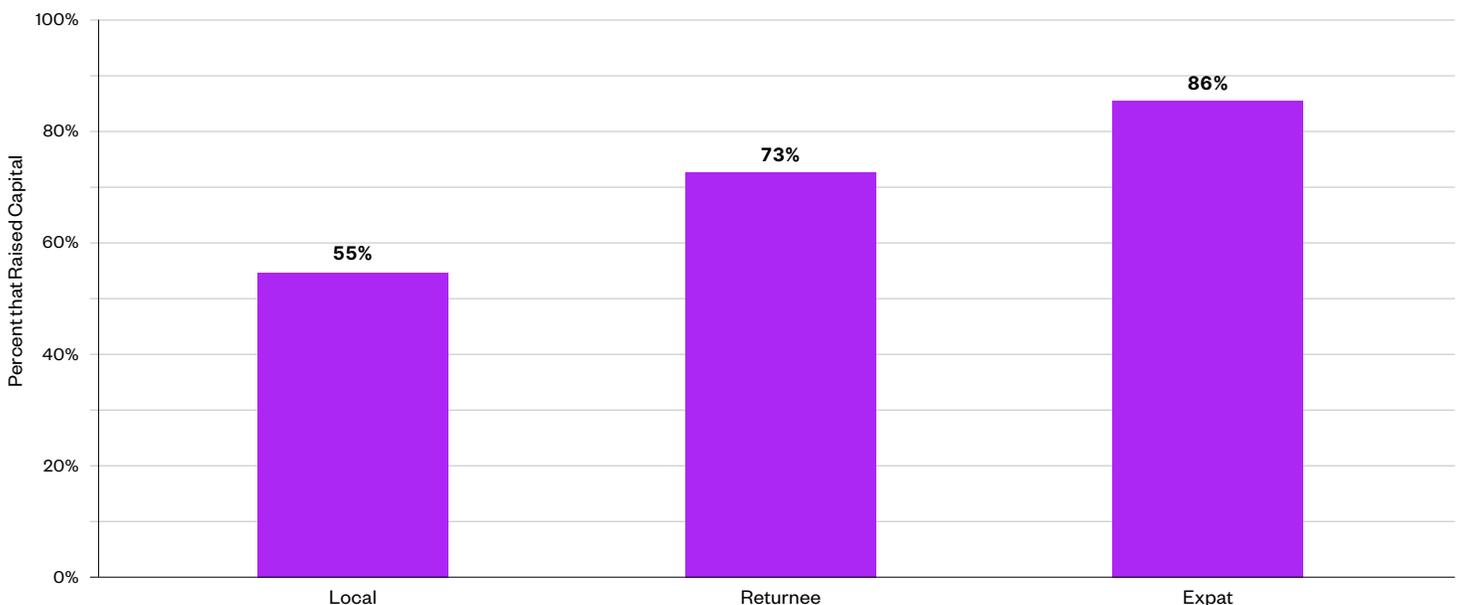
Two factors underscore this divide. Expat and returnee founders bring with them educational and professional experience (often from developed countries) and valuable relationships which can help them to succeed. Biases and a preference

for companies that have already received attention within the system of support further exacerbate these discrepancies.

Companies with at least one expat on their founding team currently have an edge in accessing capital and scaling a company, as shown in the graph below. A large majority (86 percent) of the agriculture companies which had at least one expat founder have raised capital, compared to 55 percent with all-local teams. As a result, expat founders were less likely than local founders to report access to capital as a challenge.

There is also an apparent pattern when looking at whether a company has achieved scale. Sixty percent of the agriculture companies that had at least one expat founder have scaled to 50 or more employees, compared to just 30 percent of all-local teams.

## PERCENTAGE OF COMPANIES THAT RAISED CAPITAL BY FOUNDING TEAM TYPE



Note: Founding teams are defined as "local" if they have no expat or returnee co-founder, "returnee" if they have at least one returnee but no expat co-founder, and "expat" if they have at least one expat co-founder.

Sources: Endeavor Insight interviews and analysis; LinkedIn; PitchBook; Crunchbase. Sample size: 143 companies.

While local founders also want to raise funds and scale, they cannot access capital as easily as expats, and some reported that they are often passed over by investors, who seem more interested in expat-led companies.

These findings reflect other research studies. According to a World Resources Institute study from 2020, impact investors have more incentives to direct capital to foreign-owned companies that offer higher returns on exit than smaller-scale local agriculture companies.<sup>106</sup> Despite being profitable, local entrepreneurs are more likely to build smaller businesses and stay limited in scale because of capital constraints. As that report states, investors can do more to help local entrepreneurs scale over the long term.

The gains among founding teams are not confined to those with at least one expat. There are similar advantages among founding teams with at least one returnee (founders from the local country, but who had education or work experience in a different country), although not as pronounced. Endeavor Insight found that teams with at least one returnee are 20 percent more likely to have raised capital and 10 percent more likely to have scaled than teams with local founders who had no experience abroad.

These patterns differ according to geographic region. Within the agricultural sector, expats have an outsized role in sub-Saharan Africa, while returnees and all-local teams are more common in India. In fact, returnees are almost twice as common in India than in sub-Saharan Africa. In Africa, 31 percent of agriculture companies have at least one expat founder and only 15 percent have fully local teams. All-local founding teams in Africa face more of a challenge than their counterparts in India, who are 1.5 times more likely to raise capital and three times more likely to have scaled to

50 employees or more. Since angel investors are more prevalent in regions that have a higher proportion of local entrepreneurs, these differences have implications for the development of local investment networks. In India, angel investors are more likely to be locals, while in sub-Saharan Africa they are more likely to be based abroad.

Within the two value chains studied for this research, most of the founders in Kenya are expats, while most in Nigeria are returnees. This may be a reflection of the fact that the Kenyan macadamia nut industry is export-focused. As a result, Kenyan companies were more likely to have foreign-based funders and mentors than those in Nigeria. When comparing the best-connected companies to the rest, the top performers in Kenya were also more likely to be expat-led, while the ones in Nigeria were more likely to be returnee-led.

For the agricultural sector as a whole, the prominence of expat founders, and to some extent returnees, is not ideal due to the stronger linkages local founders are generally able to cultivate with smallholder farmers. As work by the Tony Elumelu Foundation has shown, local African entrepreneurs in agriculture frequently have firsthand experiences in farming. In their focus group study of over 300 agricultural entrepreneurs, two-thirds came from households in which their parents worked in agriculture.<sup>107</sup> These direct linkages between local founders and farmers are valuable for understanding and serving their needs.

# LESSONS FOR ENTREPRENEURIAL COMMUNITIES

## **Entrepreneur-Led Economic Development provides an effective approach to strengthening local networks.\***

The findings of this report reflect many of the principles of a 2018 Endeavor Insight study on the software sector in cities across sub-Saharan Africa and South Asia, which examined how entrepreneurial communities can become more productive. It found that certain types of connections, such as mentorship or angel investment from experienced entrepreneurs, are more valuable than others. When entrepreneurs primarily receive support from staff at organizations such as accelerators, this can limit the productivity of a community, especially if the leaders of those organizations do not have relevant entrepreneurial experience. The report concluded with an approach for Entrepreneur-Led Economic Development (ELED), in which decision makers can facilitate a greater role for successful local founders.<sup>108</sup>

The 2018 study found that in comparison to Nairobi, the local software entrepreneurship community in Lagos had a greater number of overall connections between founders, as well as between founders and local investors and support organizations.<sup>109</sup> These differences also reflected in the agricultural value chains in Nigeria and Kenya, which include many software companies. A larger share of companies in the Nigerian maize sector received mentorship, and more of the mentors were locally-based, than in the Kenyan macadamia sector. The Nigerian maize value chain shows robust connections among local actors, with 81 percent of active mentors being local to the community. In contrast, only 40 percent of mentors supporting companies in the Kenyan macadamia value chain were local.

In Nairobi, the 2018 study found that the most influential organizations among the software community were support organizations rather than entrepreneurs. This is characterized as a “top-down approach” in which objectives and funding are determined by people outside the community with little to no participation by local entrepreneurial leaders.<sup>110</sup> The proliferation of support organizations in Kenya effectively elevates the influence of people with less entrepreneurial experience, crowding out the voices of top-performing entrepreneurs.

ELED strategies that prioritize the leadership and influence of successful entrepreneurs are important for the agricultural sector — and outcomes for smallholder farmers — for a number of reasons. When founders build strong connections with more experienced peers, it helps new companies scale and gain valuable knowledge from those who have been through similar situations. These relationships can be especially relevant as younger companies navigate the difficult task of bringing new solutions that help smallholder farmers cut costs and increase incomes. Additionally, if productive entrepreneurial communities foster a larger presence of midstream actors, like finance and insurance companies, this can enable farmers to afford the more expensive products that upstream companies (including IBEs) provide, such as irrigation devices.

\* For more information on Entrepreneur-Led Economic Development, see Endeavor Insight’s report “Fostering Productive Entrepreneurship Communities”, available at [endeavor.org/fpec](https://endeavor.org/fpec).



**Returnee founders are well placed to extend their relationships and networks to local businesses, and contribute to the growth of entrepreneurial ecosystems.**

The dynamics uncovered in this study have implications for the development of local entrepreneurship ecosystems. In sectors and markets where resources are scarce, such as agriculture in developing countries, the prominence of expat-led companies can have the effect of diverting funds away from local entrepreneurs. However, returnees appear better placed to contribute to the future success of domestic entrepreneurs given their lasting local connections.

According to social network theory, founders of a similar professional background are more likely to build relationships within the same group. The 2018 report showed that expat founders most frequently build relationships with other expats, and returnee founders with other returnees.<sup>111</sup> These patterns influence the trajectories of entrepreneurship communities in a way that does not necessarily strengthen the local ecosystem. While this dynamic may increase the chances for each of the two respective groups to access capital and networks, it limits opportunities for local founders to access those resources.

Endeavor Insight's analysis on agriculture in this study reflects other findings which show that capital providers have a preference for founders who have similar backgrounds and experiences as themselves. When expats and local founders compete for funding from foreign investors, expats often win because their background more closely resembles that of the funders from developed countries.<sup>112</sup> Some founders interviewed in this study expressed their perception that investors seem to prefer expats, specifically saying that there is a "bias" against local entrepreneurs.

In contrast, returnees, as members of the broader local community, are more likely to extend their relationships and networks to local businesses, thereby contributing to the growth of the entrepreneurship ecosystem. Many returnee founders stated that one of their prime motivations for starting a company stemmed from their desire to rejoin and contribute to their local community. Research by other organizations also demonstrates that returnees frequently leverage their social connections with local entrepreneurs and contribute to economic development.<sup>113</sup>

## V. Recommendations

This section provides practical recommendations for addressing the major challenges that agriculture company founders face.

There is great potential for agricultural entrepreneurs in sub-Saharan Africa and India to contribute to poverty alleviation for smallholder farmers, increased food security, and job creation. The innovative solutions developed by entrepreneurs can help increase yields, enhance market transparency, improve access to services, and more. In order for the global community to maximize these benefits and make progress towards the SDGs, decision makers should take action to address the challenges that agricultural entrepreneurs face and the systems-level gaps that persist. This section presents recommendations to improve the areas that most affect entrepreneurs: capital, talent, support, mentorship, and policy. Many of these recommendations involve cooperation between different actors, in recognition of their complementary roles and the potential benefits from a well-connected ecosystem.

Decision makers in this space need to be aware of the specific needs of the agricultural sector when making their investment decisions and designing support

programs. By following the principles of Entrepreneur-Led Economic Development (ELED), key actors can make better decisions to improve local entrepreneurship communities and consequently, the lives of farmers and the wider population. As defined in previous Endeavor Insight research, the ELED approach is based on the understanding that experienced, successful local founders are immensely valuable as knowledgeable members of the community. Listening to the leaders of the fastest-growing firms sheds light on the most critical constraints within the local market and benefits the next generation of entrepreneurs through the transfer of knowledge and direct mentorship.

In addition to the interviews with founders, Endeavor Insight spoke with over a dozen investors, support organization leaders, and other experts on agricultural entrepreneurship in sub-Saharan Africa and India. The following practical recommendations for decision makers emerged from those conversations and the analytical findings of this report.

# 1

### **Reframe agriculture as a strategic investment, while helping founders secure capital at different stages of development.**

Access to capital was the highest ranked challenge among the founders interviewed for this study. An important way to address this obstacle is to increase the availability of financing from capital providers whose goals are aligned with the founders.

Agriculture, as a prospective investment vertical, is often viewed as risky due to its unpredictability — which has been amplified by the growing impacts of climate change — and requirement for patient capital. To counteract these negative viewpoints, founders and their supporters should help

investors understand how agriculture can serve a strategic purpose. Since agriculture has a distinct risk-and-return profile in comparison to other sectors, investors can diversify their portfolios by including companies in the sector as a hedge against other investments. In fact, agriculture's essential status during the COVID-19 pandemic bolstered its demand, while other sectors faltered.<sup>114</sup>

When deals are negotiated, calculations of potential return should account for the possibility that high volumes will more

than offset the impact of low margins, both of which are typical in agriculture. These strategies would reduce the perception of risk and improve the understanding of returns associated with the sector, transforming the common calculation of the risk-return ratio.

For such adjustments to occur, investors — especially VC firms due to their prominent role across growth stages — should build stronger connections with experts who have specialized knowledge of the agricultural sector. Even when investors are more risk tolerant, their lack of familiarity with agriculture can keep them wary of entering the sector. To overcome this barrier, investors can build advisory networks with sectoral experience, as is often the case for other sectors like fintech. It can also be difficult for offshore investors to understand country-specific contextual factors if they do not have a local presence. In such cases, foreign investors can partner with

local capital firms, which can provide vital knowledge and lead the funding round, even if the foreign firm provides a larger ticket.

Support organizations and philanthropies should also play a role in these efforts. Those that already offer grant support can connect agricultural entrepreneurs to affiliated banks or to institutional investors who can provide larger scale funding as they graduate from earlier stages. This kind of cooperation between different ecosystem actors would enhance larger capital providers' awareness of the agricultural sector and help smooth the transition for founders as they reach scale. For example, the Tony Elumelu Foundation — which provides small grants and training programs to emerging founders — connects its alumni to its affiliated partner, the United Bank for Africa (UBA), as a source for larger financing.

## 2

### **Build specialized pipelines for technical and managerial talent.**

Finding the right talent is often a challenge due to the rural nature of agriculture and the specific requirements of growing an innovative company. As the second most common challenge identified by founders in this study, talent is an area where decision makers should play a larger role, especially by supporting a robust pipeline of technical talent and by facilitating connections that can help source qualified managerial talent.

In India, the IIT university system is an example of a strong pipeline for technical talent. Companies that participate in its university-based incubators and accelerators then have a convenient pool of local technical talent from which to recruit. Some Indian agriculture companies have also specialized in hiring employees from local universities close to where they operate, rather than trying to recruit and move talent from urban to rural areas. This strategy lowers competition with other firms and reduces the cost of hiring new staff. In

Africa, programs like those run by Partners in Food Solutions are building stronger pipelines by developing apprenticeships in partnership with local universities, through which qualified individuals are connected to growing companies. Such programs, which bridge the gap between STEM departments at universities and local business leaders in agriculture, can better prepare students for career opportunities in the sector. Entrepreneurs and support organizations can follow these successful models to help address the need for local technical talent.

Managerial talent is crucial to the growth of scaling businesses, but it is particularly hard to find in rural areas. Local support organizations can play a larger role in connecting founders with broader networks where potential managers can be sourced. They can leverage their programs' alumni networks to connect entrepreneurs with alumni, who can refer experienced candidates.

For example, internal social media platforms for all current and alumni entrepreneurs of a program would facilitate peer-to-peer networking and advertise current searches.

Diaspora networks are another potential source of managerial talent for agriculture companies. National and provincial governments can implement policies that incentivize diaspora professionals, especially those with experience at

multinational or entrepreneurial companies, to refer candidates or return and serve in senior positions at local companies. Such initiatives fill short-term gaps in managerial talent, while also building up the long-term capacity of the local ecosystem. Along with government policy, support organizations can create formal networks that connect local companies to diaspora talent.

# 3

## **Tailor support programs to the needs of the sector and specific innovation types.**

Support organizations can provide more meaningful assistance to agricultural entrepreneurs by accepting the particular needs and changing capabilities of their companies as they grow. For instance, support organizations should be aware of the duration and timing of their programs with respect to crop cycles. It is also important to consider that the emerging founders in agriculture often have relevant technical or sector-based experience, but some may lack experience in business operations. To address this, successful support organizations should offer multiple versions of their curricula to accommodate founders' varying levels of understanding of different topics.

When tailoring their programs, support organizations should also give consideration to companies' different innovation types. Support organizations that only provide generalized support to all types of companies should incorporate greater customization into their existing curricula, or more programs could specialize in catering to the needs of different business models. For example, by recognizing that IBEs take longer to develop and may require specialized facilities to prototype their products, support programs can establish partnerships with labs at relevant universities or research institutes. These partnerships can be mutually beneficial. For example, universities can offer

subsidized rates to support organizations to cover IBE founders' prototyping costs at those facilities, in exchange for support organizations offering the ability to bring products developed at universities to the market. Failing to account for the needs of IBEs could result in the exclusion of an entire category of companies that have demonstrated the potential to transform agriculture and contribute to food security.

Support organizations should also adjust programs to focus on companies with the highest potential impact on farmers in their respective markets. One strategy is to require program applicants to engage and consult with smallholder farmers prior to participation. Therefore, applicants would already have to demonstrate the relevance and viability of their products. Donors who fund support organizations and wish to see more programs offer tailored solutions should also adopt a flexible approach to encourage these changes. This includes increasing multi-year support or discretionary pilot funding, as well as non-financial assistance like programmatic expertise, to allow support organizations to refine their practices and develop the capacity to have an enduring impact.

# 4

## **Prioritize mentorship from local actors with agricultural experience.**

Successful entrepreneurs in agriculture, whose companies have reached scale and demonstrated impact, have much to offer their local ecosystems. They can serve as effective mentors and angel investors for new firms and can help them reach scale. As the case study of Stellapps shows, mentorship from prominent local entrepreneurs can be instrumental for a startup's success.

Following the ELED principles, support organizations should prioritize providing mentorship from local entrepreneurs who have agricultural experience. Donors should likewise elevate support organizations and networks that are led by, or have a substantial inclusion of, successful local founders. Indeed, mentors on many support organization teams currently lack the firsthand business acumen to best assist companies at the growth and expansion stages, as well as the specific-sector knowledge in agriculture. To address these shortcomings, support organizations should build meaningful connections with local founders who have successfully scaled and encourage them to become mentors.

Many African economies in particular would benefit from greater local mentorship and angel investment in agriculture. In order to make this work, a greater level of coordination and trust within the entrepreneurial community is needed. Development institutions and other foreign donors can incentivize the establishment of those networks through their roles as conveners and resource providers.<sup>115</sup>

The comparison of Nigeria's maize value chain and Kenya's macadamia value chain is instructive in this regard. The domestic-oriented value chain of maize in Nigeria has fostered a large community of local entrepreneurs. In such a context, support organizations can continue to encourage greater mentorship and reinvestment from successful founders. On the other hand, in the export-oriented value chain of macadamia in Kenya, there is a predominance of expat-led companies which do not have strong linkages to the local ecosystem and primarily have foreign mentors. In such a context, support organizations can counteract the "like-attracts-like" principle by ensuring the inclusion of local founders.

# 5

## **Provide an enabling environment for founders that facilitates entrepreneurship.**

At a more fundamental level, decision makers in African countries and India need to foster an enabling environment for local founders to succeed. Too often entrepreneurs are building infrastructure themselves, or creating secondary businesses to facilitate the delivery of their primary services. While this can pave the way for future entrepreneurs, it can put a drain on the development of the ecosystem. Instead, governments should focus on constructing the basic infrastructure and providing the services to rural areas that can make meaningful differences to entrepreneurial companies.

In addition, more transparency and stability in agricultural policies would reduce the risk perception for investors. This can be achieved by consulting with entrepreneurs when forming policy. Public-private partnerships, such as those that have emerged in the wake of COVID-19 with companies like **Farmcrowdy**, are an effective means for the public sector to understand founders' needs. Some founders also reported successfully forming associations with peer companies to jointly influence government policy. The implementation of AfCFTA provides an opportunity for African countries to

coordinate and simplify agricultural regulations to encourage the international expansion of entrepreneurial companies.

Other elements in the environment include local universities and research institutions. These organizations can play an important role in supporting the development of agriculture companies, especially IBEs, by promoting “learning by doing” and an entrepreneurial mindset among students through hands-on experiences like class projects and innovation competitions. Furthermore, conducting greater levels of research in the hard sciences at local universities would have the benefit of increasing the number of professionals with advanced degrees relevant to agriculture. These steps would enable those individuals to pursue careers in which they can apply their skills outside of academia.

In these efforts to bolster domestic R&D capacity, greater government investment is needed. Governments should financially support both basic research in agriculture and the translation of that research into usable products for smallholder farmers and others in the sector. International development institutions and other foreign donors are also in a position to shape local entrepreneurship ecosystems in agriculture. These foreign actors should reinforce local efforts to build up infrastructure, educational institutions, and R&D capacity by providing financial resources and sharing knowledge.

**Ultimately, local innovation and entrepreneurship in agriculture in sub-Saharan Africa and India will enable these developing regions to achieve positive outcomes in poverty alleviation, food security, and job creation.**



## Top Recommendations for Decision Makers

<b>Entrepreneurs</b>	<ul style="list-style-type: none"> <li>• Reframe agriculture as a strategic investment for investors.</li> <li>• Give back to the local entrepreneurial ecosystem as mentors.</li> <li>• Recruit technical talent from local universities with scientists and engineers.</li> </ul>
<b>Investors</b>	<ul style="list-style-type: none"> <li>• Understand the distinct risk-and-return profile of agriculture, and diversify portfolios by including agriculture companies.</li> <li>• Build stronger connections with experts in the agriculture sector, and develop advisory networks for investment decisions.</li> <li>• If offshore, partner with local capital providers in funding rounds.</li> </ul>
<b>Support Organizations</b>	<ul style="list-style-type: none"> <li>• Tailor programs to the needs of the sector and different innovation types (IBEs, software firms, and business process companies).</li> <li>• If providing early-stage funding, connect founders with affiliated banks or institutional investors who can provide later-stage funding.</li> <li>• Develop programs to connect companies to technical talent and leverage alumni networks for managerial talent.</li> </ul>
<b>Donors and Philanthropies</b>	<ul style="list-style-type: none"> <li>• Elevate support organizations led by successful local founders.</li> <li>• Reinforce local efforts to build up infrastructure, educational institutions, and agriculture-specific R&amp;D capacity.</li> <li>• Increase multi-year support and discretionary pilot funding, as well as non-financial assistance, to enable support organizations to refine their practices.</li> </ul>
<b>Policymakers</b>	<ul style="list-style-type: none"> <li>• Provide an enabling environment by improving infrastructure and services in rural areas, and investing in domestic R&amp;D.</li> <li>• Incentivize diaspora professionals to advise or join local entrepreneurial companies.</li> <li>• Establish more public-private partnerships with entrepreneurs.</li> </ul>
<b>Universities and Research Institutes</b>	<ul style="list-style-type: none"> <li>• Promote “learning by doing” and an entrepreneurial mindset among students.</li> <li>• Develop partnerships with support organizations to bring agriculture-relevant products to the market.</li> </ul>

**Agtech:** The use of technological solutions for agricultural services and products (also “agritech”).

**Bootstrapping:** Founding and building a company without external investment, relying instead on personal capital and the company’s operating revenues.

**Entrepreneurial companies:** For-profit businesses that are started by individuals. This excludes businesses that began as government entities or subsidiaries of larger companies.

### Founder backgrounds:

**Expatriate:** Founders who have started a business in a country that is not their home country.

**Local:** Founders who have started a business in their home country, without educational and/or work experience abroad.

**Returnee:** Founders who have started a business in their home country after gaining educational and/or work experience abroad (also referred to as “boomerang”).

### Innovation types:

**Business process companies:** Companies that primarily deliver a product or service that requires “on-the-ground” operations, and may also involve the use of technology.

**Invention-based enterprises (IBEs):** Companies that conduct research and development, and manufacture at least one component that is a physical product, oftentimes where the innovation is unique enough to be patentable.

**Software companies:** Companies that have primary activities in developing and selling technological solutions and platforms, such as e-commerce or financial technology.

**Internet of Things (IoT):** Systems by which physical devices connect to the internet to share data and communicate with a network without involving human interaction.

### Investment types:

**Angel investment:** An investment in a company made by an individual, not on behalf of a business or investment firm.

**Institutional investment:** An investment made by a company or organization.

**Venture capital:** Investment in businesses that have high growth potential. Venture capitalists (VCs) often provide expertise in finance and operations, in addition to capital.

**Mentorship:** A relationship through which a mentee will meet a mentor; in this study, defined as meeting at least three times for a minimum of 30 minutes to discuss critical business issues.

**Network:** A group of actors working to support local entrepreneurs. This includes capital providers such as investors and foundations, support organizations, government and international aid agencies, and experienced entrepreneurs.

**Scale:** A measure of a company’s growth; in this study, defined as employing 50 or more people.

**Support organizations:** Organizations offering skill-development programs, investment, mentoring, or other support for entrepreneurs. These include incubators, accelerators, and other programs.

**Value chain:** The full range of business activities that are involved in the production of a good or service. Within the agricultural value chain:

**Upstream companies:** Upstream companies provide the inputs and equipment that farmers need to grow their crops and increase crop yields.

**Midstream companies:** Midstream companies provide a range of services to farmers, such as fintech and transportation, to enable them to run their businesses and sell their produce more efficiently.

**Downstream companies:** Downstream companies purchase farmers’ produce and process, sell, and/or export it to reach the consumer.



- 1 United Nations Department of Economic and Social Affairs. "Sustainable Development Goals." [sdgs.un.org/goals](https://sdgs.un.org/goals). Accessed 10 May 2021.
- 2 Lowder, Sarah K. & Marco V. Sánchez, et al. "Which farms feed the world and has farmland become more concentrated?" Elsevier. *World Development* 142. Jun. 2021. [fao.org/family-farming/detail/en/c/1394557](https://www.fao.org/family-farming/detail/en/c/1394557). Accessed 15 Jul. 2021.
- 3 Johm, Ken B. & Olagoke Oladapo, et al. "Strategy for Agricultural Transformation in Africa 2016-2025." African Development Bank. May 2016. [afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed\\_Africa\\_-\\_Strategy\\_for\\_Agricultural\\_Transformation\\_in\\_Africa\\_2016-2025.pdf](https://afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed_Africa_-_Strategy_for_Agricultural_Transformation_in_Africa_2016-2025.pdf). Accessed 10 May 2021.
- 4 Fox, Louise & Thomas S. Jayne. "Unpacking the misconceptions about Africa's food imports." Brookings Institution. 14 Dec. 2000. [brookings.edu/blog/africa-in-focus/2020/12/14/unpacking-the-misconceptions-about-africas-food-imports](https://brookings.edu/blog/africa-in-focus/2020/12/14/unpacking-the-misconceptions-about-africas-food-imports). Accessed 12 May 2021.
- 5 Ibid.
- 6 United Nations in India. "Nutrition and Food Security." [in.one.un.org/un-priority-areas-in-india/nutrition-and-food-security](https://in.one.un.org/un-priority-areas-in-india/nutrition-and-food-security). Accessed 10 May 2021.
- 7 Fox, Louise & Thomas S. Jayne. "Unpacking the misconceptions about Africa's food imports." Brookings Institution. 14 Dec. 2000. [brookings.edu/blog/africa-in-focus/2020/12/14/unpacking-the-misconceptions-about-africas-food-imports](https://brookings.edu/blog/africa-in-focus/2020/12/14/unpacking-the-misconceptions-about-africas-food-imports). Accessed 12 May 2021; Pingali, Prabhu & Anaka Aiyar, et al. "Indian Food Systems towards 2050: Challenges and Opportunities." Palgrave Macmillan. 15 May 2019. [link.springer.com/chapter/10.1007/978-3-030-14409-8\\_1](https://link.springer.com/chapter/10.1007/978-3-030-14409-8_1). Accessed 21 May 2021.
- 8 International Bank for Reconstruction and Development / The World Bank. "World Development Report 2008: Agriculture for Development." 2007. [documents1.worldbank.org/curated/en/587251468175472382/pdf/41455optmzd0PA18082136807701PUBLIC1.pdf](https://documents1.worldbank.org/curated/en/587251468175472382/pdf/41455optmzd0PA18082136807701PUBLIC1.pdf). Accessed 10 May 2021.
- 9 Johm, Ken B. & Olagoke Oladapo, et al. "Strategy for Agricultural Transformation in Africa 2016-2025." African Development Bank. May 2016. [afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed\\_Africa\\_-\\_Strategy\\_for\\_Agricultural\\_Transformation\\_in\\_Africa\\_2016-2025.pdf](https://afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed_Africa_-_Strategy_for_Agricultural_Transformation_in_Africa_2016-2025.pdf). Accessed 10 May 2021.
- 10 Fine, David & Arend van Wamelen, et al. "Africa at Work: Job Creation and Inclusive Growth." McKinsey Global Institute. Aug. 2012. [mckinsey.com/~/media/McKinsey/Featured%20Insights/Middle%20East%20and%20Africa/Africa%20at%20work/b%20test/MGI\\_Africa\\_at\\_work\\_August\\_2012\\_Full\\_Report.pdf](https://mckinsey.com/~/media/McKinsey/Featured%20Insights/Middle%20East%20and%20Africa/Africa%20at%20work/b%20test/MGI_Africa_at_work_August_2012_Full_Report.pdf). Accessed 10 May 2021.
- 11 Ibid.
- 12 United Nations. "The Sustainable Development Goals Report 2020." 2020. [unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf](https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf). Accessed 10 May 2021; Rapsomanikis, George. "The economic lives of smallholder farmers." Food and Agriculture Organization of the United Nations. 2015. [fao.org/3/i5251e/i5251e.pdf](https://www.fao.org/3/i5251e/i5251e.pdf). Accessed 10 May 2021.
- 13 Ibid.
- 14 Johm, Ken B. & Olagoke Oladapo, et al. "Strategy for Agricultural Transformation in Africa 2016-2025." African Development Bank. May 2016. [afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed\\_Africa\\_-\\_Strategy\\_for\\_Agricultural\\_Transformation\\_in\\_Africa\\_2016-2025.pdf](https://afdb.org/fileadmin/uploads/afdb/Documents/Generic-Documents/Feed_Africa_-_Strategy_for_Agricultural_Transformation_in_Africa_2016-2025.pdf). Accessed 10 May 2021.
- 15 Wiggins, Steve. "Farmer-led irrigation in sub-Saharan Africa: building on farmer initiatives." ODI. 29 Jul. 2019. [odi.org/en/publications/farmer-led-irrigation-in-sub-saharan-africa-building-on-farmer-initiatives](https://odi.org/en/publications/farmer-led-irrigation-in-sub-saharan-africa-building-on-farmer-initiatives). Accessed 10 May 2021.
- 16 United Nations in India. "Nutrition and Food Security." [in.one.un.org/un-priority-areas-in-india/nutrition-and-food-security](https://in.one.un.org/un-priority-areas-in-india/nutrition-and-food-security). Accessed 10 May 2021.
- 17 Amaya, Laura & Johan Thuard, et al. "Bending the Arc." FSG. Jan. 2020. [fsg.org/publications/bending-the-arc](https://fsg.org/publications/bending-the-arc). Accessed 10 May 2021.
- 18 Landesa Rural Development Institute. "Smallholder Farming and Achieving Our Development Goals." Jul. 2014. [landesa.org/wp-content/uploads/Issue-Brief-Smallholder-Farming-and-Achieving-Our-Development-Goals.pdf](https://landesa.org/wp-content/uploads/Issue-Brief-Smallholder-Farming-and-Achieving-Our-Development-Goals.pdf). Accessed 10 May 2021.
- 19 Ibid.
- 20 Tsan, Michael & Swetha Totapally, et al. "The Digitalisation of African Agriculture Report 2018-19." Dalberg Advisors, The Technical Center for Agricultural and Rural Cooperation (CTA). Jun. 2019. [cta.int/en/digitalisation-agriculture-africa](https://cta.int/en/digitalisation-agriculture-africa). Accessed 10 May 2021.
- 21 Rapsomanikis, George. "The economic lives of smallholder farmers." Food and Agriculture Organization of the United Nations. 2015. [fao.org/3/i5251e/i5251e.pdf](https://www.fao.org/3/i5251e/i5251e.pdf). Accessed 10 May 2021.

- 22 Gilbert, Richard & Dr. Christina Tewes-Gradl, et al. "Strengthening Markets Through Collaboration." Business Fights Poverty & Endeava. [businessfightspovetry.org/strengthening-markets-through-collaboration](https://businessfightspovetry.org/strengthening-markets-through-collaboration). Accessed 10 May 2021.
- 23 Shakhovskoy, Matt & Clara Colina, et al. "Pathways to Prosperity State of the Sector Report." Rural and Agricultural Finance. Nov. 2019. [pathways.raflearning.org/wp-content/uploads/2019/11/2019\\_RAF-State-of-the-Sector.pdf](https://pathways.raflearning.org/wp-content/uploads/2019/11/2019_RAF-State-of-the-Sector.pdf). Accessed 10 May 2021; Fine, David & Arend van Wamelen, et al. "Africa at Work: Job Creation and Inclusive Growth." McKinsey Global Institute. Aug. 2012. [mckinsey.com/~media/McKinsey/Featured%20Insights/Middle%20East%20and%20Africa/Africa%20at%20work/b%20test/MGI\\_Africa\\_at\\_work\\_August\\_2012\\_Full\\_Report.pdf](https://mckinsey.com/~media/McKinsey/Featured%20Insights/Middle%20East%20and%20Africa/Africa%20at%20work/b%20test/MGI_Africa_at_work_August_2012_Full_Report.pdf). Accessed 10 May 2021; Hornberger, Kusi & Veronica Chau, et al. "The Missing Middles." Dalberg Advisors & Collaborative for Frontier Finance. 2018. [frontierfinance.org/missing-middles](https://frontierfinance.org/missing-middles). Accessed 10 May 2021.
- 24 United Nations. "The Sustainable Development Goals Report 2020." 2020. [unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf](https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf). Accessed 10 May 2021.
- 25 Bundervoet, Tom & Maria Eugenia Davalos. "In developing countries, the COVID-19 crisis has not affected everyone equally." World Bank Blogs. 06 Apr. 2021. [blogs.worldbank.org/voices/developing-countries-covid-19-crisis-has-not-affected-everyone-equally](https://blogs.worldbank.org/voices/developing-countries-covid-19-crisis-has-not-affected-everyone-equally). Accessed 10 May 2021.
- 26 Sasakawa Africa Association. "COVID-19's impact on agriculture systems in Africa." GAP Report, Harvest 2050 blog. 23 Jun. 2020. [globalagriculturalproductivity.org/covid-19s-impact-on-agriculture-systems-in-africa](https://globalagriculturalproductivity.org/covid-19s-impact-on-agriculture-systems-in-africa). Accessed 10 May 2021.
- 27 Ibid.; Connick, Ashley. "Food supply chains in Africa | How the pandemic has impacted." Hogan Lovells. 03 Aug. 2020. [hoganlovells.com/en/blogs/the-a-perspective/food-supply-chains-in-africa-how-the-pandemic-has-impacted](https://hoganlovells.com/en/blogs/the-a-perspective/food-supply-chains-in-africa-how-the-pandemic-has-impacted). Accessed 10 May 2021.
- 28 Ayanlade, Ayansina & Maren Radeny. "COVID-19 and food security in Sub-Saharan Africa: implications of lockdown during agricultural planting seasons." npj Science of Food 4(13). 14 Sep. 2020. [nature.com/articles/s41538-020-00073-0](https://nature.com/articles/s41538-020-00073-0). Accessed 10 May 2021.
- 29 Ibid.
- 30 Food and Agricultural Organization of the United Nations. "The State of Agricultural Commodity Markets 2020." 2020. [fao.org/documents/card/en/c/cb0665en](https://fao.org/documents/card/en/c/cb0665en). Accessed 10 May 2021.
- 31 Ibid.
- 32 United States Agency for International Development (USAID). "Informal Economy Regional Agricultural Trade Environment (RATE) Summary." Dec. 2013. [usaid.gov/sites/default/files/documents/1861/Informal\\_Economy.pdf](https://usaid.gov/sites/default/files/documents/1861/Informal_Economy.pdf). Accessed 10 May 2021; Glatzel, Katrin & Emily Alpert, et al. "Small and Growing. Entrepreneurship in African Agriculture." Jun. 2014. [mamopanel.org/media/uploads/files/SMALL\\_AND\\_GROWING\\_-\\_ENTREPRENEURSHIP\\_IN\\_AFRICAN\\_AGRICULTURE\\_2014.pdf](https://mamopanel.org/media/uploads/files/SMALL_AND_GROWING_-_ENTREPRENEURSHIP_IN_AFRICAN_AGRICULTURE_2014.pdf). Accessed 10 May 2021.
- 33 Hornberger, Kusi & Veronica Chau, et al. "The Missing Middles." Dalberg Advisors & Collaborative for Frontier Finance. 2018. [frontierfinance.org/missing-middles](https://frontierfinance.org/missing-middles). Accessed 10 May 2021.
- 34 Amaya, Laura & Johan Thuard, et al. "Bending the Arc." FSG. Jan. 2020. [fsg.org/publications/bending-the-arc](https://fsg.org/publications/bending-the-arc). Accessed 10 May 2021; Shakhovskoy, Matt & Clara Colina, et al. "Pathways to Prosperity State of the Sector Report." Rural and Agricultural Finance. Nov. 2019. [pathways.raflearning.org/wp-content/uploads/2019/11/2019\\_RAF-State-of-the-Sector.pdf](https://pathways.raflearning.org/wp-content/uploads/2019/11/2019_RAF-State-of-the-Sector.pdf). Accessed 10 May 2021.
- 35 DeHaat. "About Us." [agrevolution.in/company](https://agrevolution.in/company). Accessed 21 May 2021.
- 36 Farmcrowdy. "About Us." [farmcrowdy.com/about-us](https://farmcrowdy.com/about-us). Accessed 10 May 2021.
- 37 Hornberger, Kusi & Veronica Chau, et al. "The Missing Middles." Dalberg Advisors & Collaborative for Frontier Finance. 2018. [frontierfinance.org/missing-middles](https://frontierfinance.org/missing-middles). Accessed 10 May 2021.
- 38 Ibid.
- 39 Barto, Leah D. & Rhett Morris. "How Cities Can Identify the Best Businesses for Local Economic Growth." Endeavor Insight. Sep. 2020. [endeavor.org/best-businesses](https://endeavor.org/best-businesses). Accessed 24 May 2021.
- 40 Zee Business. "Milkbasket to invest Rs 10 cr to scale up biz; plans to set up 10 scouring centres." 11 Jun. 2019. [zeebiz.com/small-business/news-milkbasket-to-invest-rs-10-cr-to-scale-up-biz-plans-to-set-up-10-scouring-centres-101931](https://zeebiz.com/small-business/news-milkbasket-to-invest-rs-10-cr-to-scale-up-biz-plans-to-set-up-10-scouring-centres-101931). Accessed 10 May 2021.
- 41 International Finance Corporation. "Technology Helps African Farmers Sell What They Sow." Nov. 2018. [ifc.org/wps/wcm/connect/news\\_ext\\_content/ifc\\_external\\_corporate\\_site/news+and+events/news/impact-stories/technology-helps-african-farmers-sell-what-they-sow](https://ifc.org/wps/wcm/connect/news_ext_content/ifc_external_corporate_site/news+and+events/news/impact-stories/technology-helps-african-farmers-sell-what-they-sow). Accessed 10 May 2021.
- 42 Unless otherwise cited, all direct quotes and company information from Endeavor Insight interview, Mar. 2021.
- 43 Koech, Gilbert. "State considers lifting ban on logging." The Star. 29 Jun. 2020. [the-star.co.ke/news/2020-06-29-state-considers-lifting-ban-on-logging](https://the-star.co.ke/news/2020-06-29-state-considers-lifting-ban-on-logging). Accessed 10 May 2021.
- 44 Illuminum Greenhouses. "SDGs: How are we addressing them?" 16 Jan. 2020. [illuminumgreenhouses.com/2020/01/16/sdgs-how-are-we-addressing-them](https://illuminumgreenhouses.com/2020/01/16/sdgs-how-are-we-addressing-them). Accessed 10 May 2021.
- 45 Shakhovskoy, Matt & Clara Colina, et al. "Pathways to Prosperity State of the Sector Report." Rural and Agricultural Finance. Nov. 2019. [pathways.raflearning.org/wp-content/uploads/2019/11/2019\\_RAF-State-of-the-Sector.pdf](https://pathways.raflearning.org/wp-content/uploads/2019/11/2019_RAF-State-of-the-Sector.pdf). Accessed 10 May 2021.

46 Council on Smallholder Agricultural Finance (CSAF). "State of the Sector 2019." 2019. csaf.org/wp-content/  
uploads/2019/07/CSAF\_State\_of\_Sector\_2019\_Full\_Final.pdf. Accessed 10 May 2021.

47 Hornberger, Kusi & Veronica Chau, et al. "The Missing Middles." Dalberg Advisors & Collaborative for Frontier Finance.  
2018. frontierfinance.org/missing-middles. Accessed 10 May 2021; Sanyal, Sanjoy & Chen Chen, et al. "The Impact  
Investors' Blind Spot: Local Clean Energy Entrepreneurs in Kenya." World Resources Institute. 2020. wri.org/publication/  
impact-investors-blind-spot. Accessed 10 May 2021.

48 Maple Capital Advisors. "India - Agritech Investment Trends." Jul. 2020. maple-advisors.com/Agritech-Industry.pdf.  
Accessed 10 May 2021.

49 Baobab Insights. "AgTech Funding Report 2020." Feb. 2021. baobabinsights.com/wp-content/uploads/202102-AgTech-  
Funding-2020-compressed.pdf. Accessed 10 May 2021.

50 Hornberger, Kusi & Veronica Chau, et al. "The Missing Middles." Dalberg Advisors & Collaborative for Frontier Finance.  
2018. frontierfinance.org/missing-middles. Accessed 10 May 2021.

51 Taylor, Allen. "Redrawing the Map." Medium. 13 Jan. 2021. medium.com/endeavor-catalyst/redrawing-the-map-  
2602317ba4f4. Accessed 10 May 2021.

52 Forthcoming Endeavor Insight research which will be available at endeavor.org/research.

53 Partners in Food Solutions. "Fiscal Year 2019 Annual Report." partnersinfoodsolutions.com/sites/default/files/FY2019\_  
AnnualReport\_ONLINE.pdf. Accessed 10 May 2021.

54 Endeavor Insight interview, Mar. 2021.

55 Sasakawa Africa Association. "COVID-19's impact on agriculture systems in Africa." GAP Report, Harvest 2050 blog. 23  
Jun. 2020. globalagriculturalproductivity.org/covid-19s-impact-on-agriculture-systems-in-africa. Accessed 10 May 2021.

56 George, Libby. "COVID-19 is exacerbating food shortages in Africa." World Economic Forum, in collaboration with Reuters.  
27 Apr. 2020. weforum.org/agenda/2020/04/africa-coronavirus-covid19-imports-exports-food-supply-chains. Accessed  
10 May 2021.

57 Transparency International. "Corruptions Perceptions Index 2020." 2021. images.transparencycdn.org/images/CPI2020\_  
Report\_EN\_0802-WEB-1\_2021-02-08-103053.pdf. Accessed 10 May 2021.

58 World Bank. "Doing Business 2020." 2020. openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.  
pdf. Accessed 10 May 2021.

59 Ibid.

60 World Bank. "Enabling the Business of Agriculture 2019." 2019. openknowledge.worldbank.org/bitstream/  
handle/10986/31804/9781464813870.pdf. Accessed 10 May 2021.

61 Derlagen, Christian & Emiliano Magrini. "Four policy game-changers for post-pandemic African agriculture in 2021."  
London School of Economics. 28 Dec. 2020. blogs.lse.ac.uk/africaatlse/2020/12/28/four-policy-game-changers-fao-post-  
pandemic-african-agriculture-2021. Accessed 10 May 2021.

62 Pollen, William. "AfCFTA gives glimpse of new African destiny." African Business. 12 Mar. 2021. african.business/2021/03/  
trade-investment/afcfta-gives-glimpse-of-new-african-destiny. Accessed 10 May 2021.

63 Derlagen, Christian & Emiliano Magrini. "Four policy game-changers for post-pandemic African agriculture in 2021."  
London School of Economics. 28 Dec. 2020. blogs.lse.ac.uk/africaatlse/2020/12/28/four-policy-game-changers-fao-post-  
pandemic-african-agriculture-2021. Accessed 10 May 2021.

64 B The Change. "Babban Gona Helps Subsistence Farmers in Nigeria." 28 Mar. 2017. bthechange.com/sponsored-babban-  
gona-helps-subsistence-farmers-in-nigeria-c6bdd1450fa3. Accessed 10 May 2021.

65 Krell, N.T. & S.A. Giroux, et al. "Smallholder farmers' use of mobile phone services in central Kenya." Taylor & Francis  
Online. 9 Apr. 2020. tandfonline.com/doi/full/10.1080/17565529.2020.1748847. Accessed 10 May 2021; Kah, Muhammadou.  
"Africa is leapfrogging into digital agriculture." United Nations Africa Renewal. un.org/africarenewal/web-features/africa-  
leapfrogging-digital-agriculture. Accessed 10 May 2021.

66 Sri, Deepti. "India-based agritech firm Gramophone banks \$3.4m in new funding." Tech in Asia. 30 Dec. 2020. techinasia.  
com/indiabased-agritech-firm-gramophone-banks-34m-siana-capitalled. Accessed 10 May 2021.

67 Kene-Okafor, Tage. "Kenyan insurtech startup Pula raises \$6M Series A to derisk smallholder farmers across Africa." Tech  
Crunch. 25 Jan. 2021. techcrunch.com/2021/01/25/kenyan-insurtech-startup-pula-raises-6m-series-a-led-by-tlcom-capit  
al/?tpcc=ECTW2020&gucounter=1. Accessed 10 May 2021.

68 Endeavor Insight interview, Mar. 2021.

69 Unless otherwise cited, all direct quotes and company information from Endeavor Insight interview, Mar. 2021.

70 Stanley, Simon. "Farmcrowdy Review: All You Need To Know Before Investing." Medium. 31 Aug. 2020. medium.com/siitgo/  
farmcrowdy-review-all-you-need-to-know-before-investing-b356866b0051. Accessed 10 May 2021.

71 Nsehe, Mfonobong. "Nigerian Agritech Startup Farmcrowdy Raises \$1m Seed Investment." Forbes. 19 Dec.  
2017. forbes.com/sites/mfonobongnsehe/2017/12/19/nigerian-agritech-startup-farmcrowdy-raises-1m-seed-  
investment/?sh=3a486f436ba8. Accessed 10 May 2021.

72 Farmcrowdy. "About Us." farmcrowdy.com/about-us. Accessed 10 May 2021.

73 Farmcrowdy. "Farm Stories." farmcrowdy.com/farm-stories. Accessed 10 May 2021.

- 74 Ellis, Jack. "‘Grain bank’ Ergos gets \$4.6m more from existing investor Aavishkaar. Here’s why." AgFunder News. 23 Apr. 2020. [agfundernews.com/grain-bank-ergos-gets-4-6m-more-from-existing-investor-aavishkaar-heres-why.html](http://agfundernews.com/grain-bank-ergos-gets-4-6m-more-from-existing-investor-aavishkaar-heres-why.html). Accessed 21 May 2021.
- 75 Ibid.
- 76 Acumen. "EthioChicken." [acumen.org/investment/ethiochicken](http://acumen.org/investment/ethiochicken). Accessed 10 May 2021; Finnfund. "EthioChicken improves food security and living standards in Ethiopia." [finnfund.fi/en/investing/investments/case-ethiochicken](http://finnfund.fi/en/investing/investments/case-ethiochicken). Accessed 10 May 2021.
- 77 Unless otherwise cited, all direct quotes and company information from Endeavor Insight interview, Mar. 2021.
- 78 IBS Center for Management Research. "Babban Gona’s Agri-Franchising Model: Scaling up Challenges." 2018. [icmrindia.org/casestudies/catalogue/Leadership%20and%20Entrepreneurship/Babban%20Gonas-Excerpts.htm](http://icmrindia.org/casestudies/catalogue/Leadership%20and%20Entrepreneurship/Babban%20Gonas-Excerpts.htm). Accessed 10 May 2021.
- 79 Babban Gona. "Our Theory of Change." 2021. Available for download from [babbangona.com](http://babbangona.com). Accessed 10 May 2021.
- 80 Babban Gona. [babbangona.com/newsletter/1609](http://babbangona.com/newsletter/1609). Accessed 10 May 2021.
- 81 Tsan, Michael & Swetha Totapally, et al. "The Digitalisation of African Agriculture Report 2018-19." Dalberg Advisors, The Technical Center for Agricultural and Rural Cooperation (CTA). Jun. 2019. [cta.int/en/digitalisation-agriculture-africa](http://cta.int/en/digitalisation-agriculture-africa). Accessed 10 May 2021; Shakhovskoy, Matt & Clara Colina, et al. "Pathways to Prosperity State of the Sector Report." Rural and Agricultural Finance. Nov. 2019. [pathways.rafllearning.org/wp-content/uploads/2019/11/2019\\_RAF-State-of-the-Sector.pdf](http://pathways.rafllearning.org/wp-content/uploads/2019/11/2019_RAF-State-of-the-Sector.pdf). Accessed 10 May 2021; Disrupt Africa. "Disrupt Africa African Tech Startups Funding Report 2020." 2021. [disrupt-africa.com/funding-report](http://disrupt-africa.com/funding-report). Accessed 10 May 2021.
- 82 Tsan, Michael & Swetha Totapally, et al. "The Digitalisation of African Agriculture Report 2018-19." Dalberg Advisors, The Technical Center for Agricultural and Rural Cooperation (CTA). Jun. 2019. [cta.int/en/digitalisation-agriculture-africa](http://cta.int/en/digitalisation-agriculture-africa). Accessed 10 May 2021.
- 83 Shakhovskoy, Matt & Clara Colina, et al. "Pathways to Prosperity State of the Sector Report." Rural and Agricultural Finance. Nov. 2019. [pathways.rafllearning.org/wp-content/uploads/2019/11/2019\\_RAF-State-of-the-Sector.pdf](http://pathways.rafllearning.org/wp-content/uploads/2019/11/2019_RAF-State-of-the-Sector.pdf). Accessed 10 May 2021.
- 84 Tsan, Michael & Swetha Totapally, et al. "The Digitalisation of African Agriculture Report 2018-19." Dalberg Advisors, The Technical Center for Agricultural and Rural Cooperation (CTA). Jun. 2019. [cta.int/en/digitalisation-agriculture-africa](http://cta.int/en/digitalisation-agriculture-africa). Accessed 10 May 2021.
- 85 Biztech Africa. "African agri-tech ecosystem grows 110% in last two years." 10 May 2018. [biztechafrika.com/article/african-agri-tech-ecosystem-grows-110-last-two-yea/13544](http://biztechafrika.com/article/african-agri-tech-ecosystem-grows-110-last-two-yea/13544). Accessed 10 May 2021.
- 86 Baobab Insights. "AgTech Funding Report 2020." Feb. 2021. [baobabinsights.com/wp-content/uploads/202102-AgTech-Funding-2020-compressed.pdf](http://baobabinsights.com/wp-content/uploads/202102-AgTech-Funding-2020-compressed.pdf). Accessed 10 May 2021.
- 87 Quiroz, Diana & Barbara Kuepper, et al. "Value Chain Analysis of Macadamia Nuts in Kenya." The Centre for the Promotion of Imports from Developing Countries (CBI). Dec. 2019. [cbi.eu/sites/default/files/market\\_information/researches/VCA%20Kenya%20Macadamia%20nuts%202019%20DEF.pdf](http://cbi.eu/sites/default/files/market_information/researches/VCA%20Kenya%20Macadamia%20nuts%202019%20DEF.pdf). Accessed 10 May 2021.
- 88 Muthoka, Nancy & Paul Kiuru, et al. "Macadamia Nut Production and Research in Kenya." The African Journal of Plant Science and Biotechnology, Global Science Books. 21 Sep. 2008. [globalsciencebooks.info/Online/GSBOOnline/images/0812/AJPSB\\_2\(1&2\)/AJPSB\\_2\(2\)46-48o.pdf](http://globalsciencebooks.info/Online/GSBOOnline/images/0812/AJPSB_2(1&2)/AJPSB_2(2)46-48o.pdf). Accessed 10 May 2021; Floy, Sam. "Cracking the nut industry: how Kenya adopted the world’s most valuable nut, with Charles Muigai." The East Africa Business Podcast. 28 Nov. 2019. [buzzsprout.com/384352/2170217-cracking-the-nut-industry-how-kenya-adopted-the-world-s-most-valuable-nut-with-charles-muigai](http://buzzsprout.com/384352/2170217-cracking-the-nut-industry-how-kenya-adopted-the-world-s-most-valuable-nut-with-charles-muigai). Accessed 10 May 2021.
- 89 Ibid.
- 90 Ibid.
- 91 Quiroz, Diana & Barbara Kuepper, et al. "Value Chain Analysis of Macadamia Nuts in Kenya." The Centre for the Promotion of Imports from Developing Countries (CBI). Dec. 2019. [cbi.eu/sites/default/files/market\\_information/researches/VCA%20Kenya%20Macadamia%20nuts%202019%20DEF.pdf](http://cbi.eu/sites/default/files/market_information/researches/VCA%20Kenya%20Macadamia%20nuts%202019%20DEF.pdf). Accessed 10 May 2021.
- 92 Marete, Gitonga & Caroline Wambui. "Macadamia: Money maker of the moment." Nation Africa. 14 Jun. 2019. [nation.africa/kenya/business/seeds-of-gold/macadamia-money-maker-of-the-moment-176944](http://nation.africa/kenya/business/seeds-of-gold/macadamia-money-maker-of-the-moment-176944). Accessed 10 May 2021.
- 93 Mojeed, Abdulkareem & Fatima Muktar. "Special Report: How Nigeria’s maize production has grown since 1960." Premium Times Nigeria. 10 Jan. 2021. [premiumtimesng.com/news/headlines/435678-special-rrport-how-nigerias-maize-production-has-grown-since-1960.html](http://premiumtimesng.com/news/headlines/435678-special-rrport-how-nigerias-maize-production-has-grown-since-1960.html). Accessed 10 May 2021.
- 94 Food and Agriculture Organization of the United Nations. "Global Information and Early Warning System, Country Brief Nigeria." 4 Jan. 2021. [fao.org/gIEWS/countrybrief/country.jsp?code=NGA](http://fao.org/gIEWS/countrybrief/country.jsp?code=NGA). Accessed 10 May 2021.
- 95 Food and Agriculture Organization of the United Nations. "Small Family Farms Country Factsheet. Nigeria." 2018. [fao.org/3/i9930en/I9930EN.pdf](http://fao.org/3/i9930en/I9930EN.pdf). Accessed 10 May 2021.
- 96 Abdulaleem M.A. & F. M. Oluwatusin, et al. "Efficiency of Maize Production among Smallholder Farmers in Southwest, Nigeria." Asian Journal of Agricultural Extension, Economics & Sociology. 18 Mar. 2019. [journalajaees.com/index.php/AJAEES/article/view/30120/56508](http://journalajaees.com/index.php/AJAEES/article/view/30120/56508). Accessed 10 May 2021.

- 97 Commodity Port. "Nigerian farmers reduce maize production target due to COVID-19, insecurity." 21 Jul. 2020. commodity-port.com/nigerian-farmers-reduce-maize-production-target-due-to-covid-19-insecurity. Accessed 10 May 2021; Isaac, Nkechi. "Nigeria's maize import ban could boost adoption of GM varieties." Cornell University Alliance for Science. 29 Sep. 2020. allianceforscience.cornell.edu/blog/2020/09/nigerias-maize-import-ban-could-boost-adoption-of-gm-varieties. Accessed 10 May 2021.
- 98 Sahara Reporters. "Despite Ban, Nigerian Government Secretly Permits Four Companies To Import Maize." 3 Sep. 2020. saharareporters.com/2020/09/03/despite-ban-nigerian-government-secretly-permits-four-companies-import-maize. Accessed 10 May 2021.
- 99 Morris, Rhett & Lili Török. "Fostering Productive Entrepreneurship Communities." Endeavor Insight. Oct. 2018. endeavor.org/fpec. Accessed 10 May 2021.
- 100 Jackson, Tom. "The top 5 Kenyan startup sector developments of 2020." Disrupt Africa. 23 Dec. 2020. disrupt-africa.com/2020/12/23/the-top-5-kenyan-startup-sector-developments-of-2020. Accessed 10 May 2021; Mpungu, Pauline. "Kenya's agritech startups aim to bridge food deficit." Al Jazeera. 22 Aug. 2019. aljazeera.com/economy/2019/8/22/kenyas-agritech-startups-aim-to-bridge-food-deficit. Accessed 10 May 2021.
- 101 Gedde, Maïa & Teminah Musyoki (Mowgli Mentoring). "Evaluating the Potential of a Mentoring Programme for Tech Entrepreneurs in Rwanda." Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH. 2020. mowgli.org.uk/sites/default/files/Mentoring%20for%20ESOs%20guide.pdf. Accessed 10 May 2021.
- 102 Unless otherwise cited, all direct quotes and company information from Endeavor Insight interview, Mar. 2021.
- 103 Global Accelerator Learning Initiative (GALI). galidata.org. Accessed 10 May 2021.
- 104 Global Accelerator Learning Initiative (GALI). "Does Acceleration Work: Five Years of Evidence from the Global Accelerator Learning Initiative." May 2021. galidata.org/assets/report/pdf/Does%20Acceleration%20Work\_EN.pdf. Accessed 30 May 2021.
- 105 Coussa, Greg & Tej Dhami, et al. "What Small and Growing Businesses Need to Scale Up." Spring Impact & Numbers for Good. Mar. 2018. springimpact.org/wp-content/uploads/2018/04/SpringImpact-NFG-Report-final-spreads\_Updated.pdf?utm\_source=SGB&utm\_medium=PDF&utm\_campaign=Replicationwow&utm\_term=SGB. Accessed 10 May 2021.
- 106 Sanyal, Sanjoy & Chen Chen, et al. "The Impact Investors' Blind Spot: Local Clean Energy Entrepreneurs in Kenya." World Resources Institute. 2020. wri.org/publication/impact-investors-blind-spot. Accessed 10 May 2021.
- 107 Rice, David A. & Somachi Chris-Asoluka. "Unleashing Africa's Agricultural Entrepreneurs: Improving the Enabling Environment for Agriculture." The Tony Elumelu Foundation. Feb. 2016. tonyelumelufoundation.org/wp-content/uploads/2018/10/Unleashing-Africas-Agricultural-Entrepreneurs.pdf. Accessed 10 May 2021.
- 108 Morris, Rhett & Lili Török. "Fostering Productive Entrepreneurship Communities." Endeavor Insight. Oct. 2018. endeavor.org/fpec. Accessed 10 May 2021.
- 109 AbdelAzim, Maha & Rhett Morris, et al. "Addendum: Fostering Productive Entrepreneurship Communities." Endeavor Insight. Oct. 2018. endeavor.org/content/uploads/2015/06/Addendum.pdf. Accessed 10 May 2021.
- 110 Morris, Rhett & Lili Török. "Fostering Productive Entrepreneurship Communities." Endeavor Insight. Oct. 2018. endeavor.org/fpec. Accessed 10 May 2021.
- 111 Ibid.
- 112 Lall, Saurabh A. & Li-Wen Chen, et al. "The Expat Gap: Are Local-Born Entrepreneurs in Developing Countries at a Disadvantage When Seeking Grant Funding?" Public Administration Review 79(6). Oct. 2019. onlinelibrary.wiley.com/doi/abs/10.1111/puar.13076. Accessed 10 May 2021.
- 113 Pruthi, Sarika. "Social ties and venture creation by returnee entrepreneurs." International Business Review 23(6). Dec. 2014. sciencedirect.com/science/article/abs/pii/S096959311400050X. Accessed 10 May 2021; Kenny, Martin & Dan Breznitz, et al. "Coming back home after the sun rises: Returnee entrepreneurs and growth of high tech industries." Research Policy 42(2). Mar. 2013. sciencedirect.com/science/article/abs/pii/S0048733312001710. Accessed 10 May 2021.
- 114 Kolodny, Lora. "Covid and 'peak cow' created a boom for food and agriculture tech in 2020." CNBC. 30 Apr. 2021. cnbc.com/2021/04/30/food-and-agriculture-start-ups-raised-record-22point3-billion-in-2020.html. Accessed 10 May 2021. Ghode, Pankaj. "Agritech during COVID-19: Has it lived up to the hype?" The Economic Times. 28 Nov. 2020. economictimes.indiatimes.com/small-biz/sme-sector/agritech-during-covid-19-has-it-lived-up-to-the-hype/articleshow/79459264.cms. Accessed 10 May 2021.
- 115 Moellenbrock, Bonny & Carrie Gonnella. "Angel Networks in Emerging Markets: A Guide for Development Institutions." Duke University Fuqua School of Business. centers.fuqua.duke.edu/case/knowledge-center/emerging-market-angel-networks. Accessed 10 May 2021.

# Photo Credits

- p. 9 photo courtesy of Illuminum Greenhouses
- p. 13 photography by Kieran Kesner
- pp. 14–15 photos courtesy of Illuminum Greenhouses
- p. 20 photo courtesy of Illuminum Greenhouses
- p. 22 photo courtesy of Ayaneshu Bhardwaj on Unsplash
- p. 23 photo courtesy of Kobo360
- p. 25 photo courtesy of Make It Kenya / Stuart Price on Flickr
- p. 27 photography by Kieran Kesner
- p. 29 photography by Kieran Kesner
- pp. 30–31 photos courtesy of Farmcrowdy
- p. 33 photo courtesy of Farmcrowdy
- p. 35 photo courtesy of Alexas Photos on Pexels
- pp. 36–37 photos courtesy of Babban Gona
- p. 38 photography by Kieran Kesner
- p. 44 photos courtesy of Kobo360
- p. 45 photo courtesy of Farmcrowdy
- pp. 46–47 photos courtesy of Stellapps
- p. 53 photo courtesy of DeHaat
- p. 58 photo courtesy of Amol Sonar on Unsplash
- p. 61 photo courtesy of Illuminum Greenhouses

# Attribution

The content of this report, including all text and graphics, are licensed under the Creative Commons Attribution-NoDerivatives 4.0 International License.

Users are free to: Share — copy and redistribute the material in any medium or format for any purpose.

Under the following terms:

**Attribution** — You must give appropriate credit, provide a link to the license, and indicate if changes were made. You may do so in any reasonable manner, but not in any way that suggests the licensor endorses you or your use.

**No Derivatives** — If you remix, transform, or build upon the material, you may not distribute the modified material.

**No Additional Restrictions** — You may not apply legal terms or technological measures that legally restrict others from doing anything the license permits.

