ACKNOWLEDGEMENTS

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TABLE OF CONTENTS

Executive Summary 4

1. The rise of Platforms in smallholder-related agricultural markets 7

2. The potential of agricultural Platforms 15

3. Emerging types of agricultural Platforms 21

4. Evolving marketplace service delivery models and challenges 35

5. Transforming agricultural markets 49

6. The path ahead 56

Annex 58
FOREWORD

In the last decade, Digital Platforms have transformed how the world shops, travels, eats, communicates, and is entertained. Platform models—such as Facebook, Amazon, Netflix, WhatsApp, Uber, and Airbnb—have fundamentally reshaped markets. In the process, they have become some of the most valuable companies in history. In fact, Platform models composed 60-70% of a recent list of 200 “unicorns” (start-ups with valuations of USD 1 billion or more) and net earnings of Platforms on the S&P 500 have grown nearly 20 times faster than the average.

Despite this, the rise of Platforms in smallholder agricultural markets lags behind that in other sectors by up to two decades. Early pioneers have garnered significant attention, but there remains limited understanding in the sector of what constitutes a Platform, with many using the word to describe a variety of different models. Despite this lack of shared definition, a number of donors are pursuing strategies to realize the promise of Platforms in the agricultural sector. This focus has only increased in the wake of the COVID-19 pandemic, with digital service provision seeing significant uptake across the globe.

In this report, we examine the emergence of Platforms in smallholder-related agricultural markets in order to bring some clarity to the sector. This exercise has been more extensive and complex than much of our previous research, in large part because Digital Platforms are complex and come in many forms. This research required delving deeply into the dynamics of Platforms to establish a shared definition of the term, as well as analyzing decades of Platform experience in more developed markets and sectors. The findings in this report have been heavily influenced by almost two decades of academic and business research focused on Platform models and network effects. From this, we have extrapolated lessons to guide the early emergence of agricultural Platforms, including what challenges we can expect to emerge.

By making clear distinctions between different Platform models, this report clarifies an increasingly overused and ill-defined concept in agricultural development. We remain convinced that Platforms have the potential to transform smallholder agriculture into a more inclusive, sustainable, and commercially viable endeavor, and to greatly increase smallholder farmers’ access to products, services, information, and investment.

At the same time, we believe it is necessary for donors, investors, researchers, and providers to approach the promise of Platform models with deeper understanding. This includes more specificity of language, better understanding of complex business models and the role of subsidy, and recognition of the potential negative impacts that can come from mis-managed Platform models. Our hope is that this report can help us collectively take that next step forward.

Matt Shakhovskoy
Senior Advisor
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Platforms represent an exciting opportunity to transform smallholder agricultural markets—shifting from fragmentation to a more efficient exchange of goods, services, and information. However, even as grant funding is fueling a cycle of Platform innovation, it’s clear that the term is too loosely defined. Thus, in this report, we set out to broadly answer the question: “What is a Platform?” Drawing on more than 20 years of academic and applied research, we define Digital Platforms as models that facilitate direct interactions between multiple users for the purposes of exchange. The Platform business model stands in stark contrast to traditional pipeline businesses, which utilize a linear process of producing and distributing goods and services to consumers.

In contrast to general “digital solutions” and “coordination initiatives,” Digital Platforms are built around network effects. These effects are a unique byproduct of enabling multiple users on both sides of an exchange to interact, creating the potential for exponentially more value the larger the network grows. These distinctions are a crucial first step in establishing a more solid foundation for the use and growth of Platform innovations in smallholder agriculture.

The rise and promise of Platforms in smallholder-related markets

Early Digital Platform innovations in agriculture have taken two major forms. The first is mature, multi-sector communications, social media, content, investment, and payment Platforms being utilized by different actors in agricultural value chains, increasing connectivity and efficiency in a number of interactions. The second is the emergence of more than 75 agriculture-specific product and service marketplaces that span eight distinct models. These marketplaces have the potential to transform the way agricultural markets operate: in some cases, creating access to new services entirely, and in others dis-intermediating and re-intermediating existing access to goods and services.

In this research, we conducted a deep dive into these product and service marketplaces, the vast majority of which are less than five years old. This research revealed, among other insights, that 75% of these marketplaces are operated by tech start-ups, less than 25% reach more than 100,000 farmers (with only 10% reaching over one million), and 50% are located in Kenya and India. This paints a picture of a business model well suited to an enabling ecosystem and to the neutral, technology-based strengths of start-ups.

Our analysis also offers insight into why Digital Platforms—which have dominated other sectors for two decades—have lagged behind in agriculture. Until recently, the scale and quality of digital connectivity among smallholder farmers was the primary constraint. But even as rural connectivity has improved, Platforms have gained little ground in agriculture. The nature of interactions in smallholder-related agricultural markets—including volatile prices, low transaction values, and localized/seasonal production—and, more importantly, the lack of a physical enabling
transactions, the excess value created by Platforms may be too small to share between farmers, buyers, sellers, and the Platform itself.

Faced with this variety of challenges, Platform operators are experimenting with a wide range of service delivery models—with no winning models emerging just yet. But we remain optimistic about the potential for commercial viability. Interest and investment in the sector is healthy, and a handful of players (particularly in more mature markets like India) have reached critical mass, monetized their user base, and even attracted commercial funding.

While the promise of Platforms is high, global experience tells a cautionary tale. As Platforms scale, they often accumulate significant market power. Examples abound of the ways in which this power can lead to less competition, displacement of vendors and vulnerable small and medium-sized enterprises (SMEs), lower workforce protections, a more significant income divide with those users who can not easily connect and data and security issues. This is shaped, in part, by the way in which Platforms create governance systems, rules, and approaches to managing scale in their network of users. These downside risks must be weighed carefully by regulators against the positive outcomes that can potentially be achieved for all users.
The path from here

As the early excitement around Platforms gives way to the more difficult work of refining specific models, we believe there is a pressing need for:

- **A move from general hype to deep interest in particular models:** As a sector, we need a common definition of Platforms and a shared language for analyzing and assessing them that can shape agendas, funding and impact theses to realize the potential of Platforms. This includes understanding the contexts to which specific types of Platforms are well suited (or not) and their business model specifications;

- **Any further application of subsidy to be linked to specific theses:** More innovation subsidy is needed, but only to back identified tipping point strategies that can sustain innovation and transform markets in inclusive, sustainable and commercially viable ways; and

- **A more systemic view of how Platforms might shape the rural and agricultural market in the long term,** building off from the experience in developed markets and including the critical role of governance in managing possible downside risks.
1. THE RISE OF PLATFORMS IN SMALLHOLDER-RELATED AGRICULTURAL MARKETS

Historical emergence of agricultural Platforms

Over the last 40 years, service provision for smallholder farmers has transitioned from being primarily government-led to involving a complex ecosystem of public, private, and nonprofit actors. At the same time, the increasing uptake of digital technology worldwide has allowed for new tools and models to be employed in serving even the most remote rural customers.

Figure 1: Evolution of smallholder agricultural services

Source: ISF Advisors and RAF Learning Lab analysis

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Within this context, two important shifts in service delivery over the last decade have enabled the emergence of more technology-driven solutions for serving farmers, often by private sector players:

1. A shift toward **market-based approaches to service delivery**, with a focus on sustainability, investability, efficiency, and replicability of models. This shift has also caused service providers to place increased emphasis on the customer value proposition and cost effectiveness of interventions.

2. Increasingly **digitally-enabled service delivery**, both by new entrants built around digital technology and by existing providers incorporating technology into their existing business models.

Market-based approaches have also caused a paradigm shift in how farmers are viewed. In the past, farmers were considered primarily as beneficiaries of top-down, donor-funded projects or public extension. With the emergence of market-based approaches, private actors have begun to see farmers as customers with particular wants and needs—and as a market opportunity potentially worth billions of dollars. Other entities have followed suit, with donors, investors, and governments also expanding their support for market-based approaches to smallholder service delivery.

These commercially oriented models would not be possible without the parallel emergence and uptake of digital technologies. Serving farmers in remote areas with low population density has always been a costly endeavor. Now, digital technology allows organizations to create more sustainable and scalable models for service delivery. As a result, more farmers are being reached with services that are increasingly customized to meet their needs and available on demand. Service providers can reach greater scale while remaining cost effective, and can obtain better quality data about their customers. In turn, this data can be used to improve service design and delivery and optimize monetization strategies.

**Figure 2: Digital agricultural services (2009-2019)**

- Smart farming
- Agri digital financial services
- Agri e-commerce
- Digital procurement
- Digital advisory

<table>
<thead>
<tr>
<th>Year</th>
<th>Smart farming</th>
<th>Agri digital financial services</th>
<th>Agri e-commerce</th>
<th>Digital procurement</th>
<th>Digital advisory</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>53</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2010</td>
<td>59</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2011</td>
<td>71</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2012</td>
<td>97</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
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<tr>
<td>2013</td>
<td>152</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
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<tr>
<td>2014</td>
<td>195</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2015</td>
<td>287</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
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<tr>
<td>2016</td>
<td>400</td>
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<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2017</td>
<td>518</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2018</td>
<td>626</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
<tr>
<td>2019</td>
<td>713</td>
<td>59</td>
<td>71</td>
<td>97</td>
<td>152</td>
</tr>
</tbody>
</table>

Note: Government digital services not included. Multiple services can be offered by a single provider.

These digitally enabled service delivery shifts have led to an explosion of new digital agricultural services over the last decade, many of them calling themselves “Platforms.” A wide variety of development actors, from donors to NGOs, have also mobilized support for the development of Platforms, seeing vast opportunity to transform agricultural markets at scale. These actors are providing grants, investment, research, and business strategy support. Yet there remains limited understanding in the sector of what constitutes a Platform, with many using the word to describe a variety of different models. Without a common taxonomy and framework, learning around how Platforms can be used in agriculture has been limited.

**What are Platforms?**

In broader academic and business literature, there is a clear and widely shared understanding of Platform business models. Platforms are a distinct business model that represents a departure from traditional businesses, which are often referred to as “pipeline” businesses. Pipeline businesses create value by selling goods and services, often with some level of value addition—for example, beverage companies sell roasted and packaged coffee. Pipeline businesses are linear in nature, which means there is a clear transfer of value from a single seller to buyers.

Platform businesses, on the other hand, create value by enabling interactions among multiple users. The more valuable the interactions they enable, the greater value they create. The Platform itself often doesn’t produce goods or services, but rather facilitates linkages between those that do and others who want to purchase the goods and services.

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3 Interactions refer to the exchange of information, goods, or services between producers (of the subject of the exchange) and consumers.
Figure 3: Pipeline and Platform business models

<table>
<thead>
<tr>
<th>DESCRIPTION</th>
<th>PIPELINE BUSINESS MODEL</th>
<th>PLATFORM BUSINESS MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Create value through a relatively linear process of producing, distributing, and, ultimately, selling goods and services to consumers.</td>
<td>Models whose core function is creating value by enabling interactions among Platform users.</td>
</tr>
<tr>
<td>Production</td>
<td></td>
<td>Creators of the Platform's offerings. Value and data exchange and feedback.</td>
</tr>
<tr>
<td>Distribution</td>
<td></td>
<td>Value and data exchange and feedback.</td>
</tr>
<tr>
<td>Marketing</td>
<td></td>
<td>Buyers or users of the offerings.</td>
</tr>
<tr>
<td></td>
<td>Interfaces for the Platform.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>KEY DRIVERS</th>
<th>PIPELINE BUSINESS MODEL</th>
<th>PLATFORM BUSINESS MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Securing control of resources. • Maximizing value to the customer. • Optimizing supply-side economies of scale.</td>
<td>• Optimizing and driving interactions. • Increasing value of Platform for users as scale increases. • Optimizing demand-side economies of scale.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>METRICS OF SUCCESS</th>
<th>PIPELINE BUSINESS MODEL</th>
<th>PLATFORM BUSINESS MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sales of goods and services.</td>
<td>Value and volume of interactions.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXAMPLES</th>
<th>PIPELINE BUSINESS MODEL</th>
<th>PLATFORM BUSINESS MODEL</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Cargill, Nestle, H&amp;M, Coca-Cola, Amazon, Alibaba, Uber, Airbnb.</td>
<td></td>
</tr>
</tbody>
</table>

Platform models create value through enabling interactions, while pipeline businesses create value through selling goods and services.

As a starting point for this research, we classify those that commonly refer to themselves as Platforms into three distinct categories.

**Digital Platforms** tend to be private sector-led, with a focus on facilitating exchanges between users. Improving the volume, value, or likelihood of an exchange or interaction, or reducing the transaction cost of such, is how Digital Platforms create value. Importantly, the interactions facilitated by Digital Platforms involve multiple users on each side of an interaction. The Digital Platform operator itself is not considered a direct participant in the interactions but rather a facilitator. **Digital solutions**, on the other hand, tend to be software-based services provided directly to customers, which can be businesses or farmers/consumers. The software can be used to facilitate and optimize interactions but typically without multiple users on each side; instead, the solution is provided by a single actor and either applied to that actor’s own operations or targeted at that single actor’s customers.

Finally, **coordination initiatives** bring together a range of actors around a common issue or strategy, and are typically not digitally enabled. Coordination initiatives are often referred to as Multi-stakeholder Platforms (MSPs), and may be run by/include any actor, including public, private, civil society, and multilateral organizations. Their value is around creating shared learning agendas, action frameworks, and other means of enhancing learning and coordination, and typically focus on a specific issue or value chain.

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**Figure 4: Common Platform associations in agriculture**

1. **DIGITAL PLATFORMS**
   - Models that facilitate direct interactions between multiple users for the purpose of exchange
   - Examples: DigiFarm, Taobao.com, ThTrade, DeHaat, Farm to Market Alliance

2. **DIGITAL SOLUTIONS**
   - Digital products/services provided directly to farmers, consumers or businesses, which can encompass any of the main digital ag use cases
   - Examples: Cropin, Farmforce, DigitalGreen, FarmERP

3. **COORDINATION INITIATIVES**
   - Initiatives that bring multiple actors together to address systemic challenges through brokering, knowledge sharing and coordination
   - Examples: Gain, World Cocoa Foundation, GrowAsia

Notes: Digital solutions are the subject of much recent work on service delivery models, for instance the Service Delivery Model work by IDH Farmfit, the Digitalization of African Agriculture report developed by CTA in 2019, and Grow Asia’s Digital Program. Coordination initiatives have existed for a long time in SHF agriculture, and these models have been the subject of much research and knowledge sharing, most recently through the work of the Royal Tropical Institute on Multi-stakeholders Platforms (MSPs)

Source: ISF Advisors and RAF Learning Lab analysis
THE EMERGENCE OF DIGITAL SOLUTIONS

Digital solutions have also become more commonplace in the last decade. These have included:

- **B2B software solutions**: Specialist software solution providers—such as FarmERP and Cropin—that create the enabling systems for other businesses to use. Can include specialist customer relationships management (CRM), enterprise resource planning (ERP), and core banking solutions that are typically licensed on a Software as a Service (SaaS) basis.

- **B2C and B2B2C digital service solutions**: Specialist digital service providers—such as Arifu, iProcure, and aWhere—that provide specialist digital services (e.g., agronomic advice, digital wallets, or communication applications) that can be delivered directly to farmers or complement the core services of other businesses.

- **In-house software solutions**: The development of in-house software solutions—such as Olam AJSourse, Cargill’s CocoaWise suite of digital tools, and Barry Callebaut’s BC Live—that are created to enable smooth operations of pipeline businesses.

**THE GREY AREA**: Some of the distinctions between Digital Platforms and digital solutions can seem very fine, with a number of Digital Platform models operating alongside a more traditional pipeline business-based digital solution. Some of these Digital Platform models that heavily curate participation on the Platform, have limited numbers of product or service providers, or directly manage contracted fulfillment could be considered more of a digital solution. Similarly, many digital solutions providers could evolve into Digital Platform providers themselves or enable companies using their SaaS solutions to set up a Digital Platform.

This brief note focuses exclusively on Digital Platforms as a new set of business models emerging in agriculture to facilitate exchange between users. The aforementioned paradigm shifts toward market-based approaches and digital technologies have pushed Digital Platforms into the spotlight when it comes to agricultural development. These Platforms arguably represent the most significant new business model innovation in digital service provision, as well as the greatest potential for impact on smallholder farmers. While there is an extensive research base (and a number of support programs) around digital solutions, there is very little research on Digital Platforms.

Digital Platforms are defined by three common characteristics:

1. **They connect multiple users.** Platforms are meant to solve market frictions. In the case of smallholder agriculture, the primary friction is barriers that keep market participants from interacting with each other. Digital Platforms enable and facilitate interactions between multiple users on both sides of an interaction (e.g., many farmers have the ability to interact with multiple goods or services providers). These users can be producers or consumers on the Platform—and in some cases (e.g., Facebook), they can be both. Platforms can connect only one type of user (e.g., WhatsApp) or two or more types (e.g., Amazon).

2. **They generate network effects.** Digital Platforms are unique in generating value through network effects, which refers to the impact that the size of a Platform (i.e., number of users) has on the value proposition of that Platform to its users. In other words, even if the specific goods or services facilitated by the Platform remained static, the mere number of Platform users can increase the value created by the Platform. Network effects
can be positive, if the value increases as users increase, or negative if the inverse is true—for instance, when too many users on the Platform increases searching costs or decreases average quality of interactions.

3. **They are digitally enabled.** While some physical business models, like shopping malls, can have both of the characteristics listed above, they do not have the key differentiator of digital technology. This technology is a key driver of the transformative potential of Platforms because it allows them to aggregate high numbers of users and enable high volumes of interactions. Digital technologies enhance the positive network effects of these Platforms by enabling scale.

While all Digital Platforms enable interactions, academic and business literature further distinguishes between two primary types of Platforms. **Transaction Platforms** act as intermediaries for direct exchange of goods or services. These Platforms can facilitate different types of transactions—from product and service marketplaces to social networks to payment or investment Platforms. **Innovation Platforms**, on the other hand, provide the technological foundation on which third parties can develop their own digital products and services. Building on the literature available, we use the following taxonomy of Digital Platforms as a basis for this report.

**Figure 5: Types of Digital Platforms**

<table>
<thead>
<tr>
<th>TYPES OF DIGITAL PLATFORMS</th>
<th>DEFINITION</th>
<th>TYPICAL FUNCTIONS</th>
<th>EXAMPLES USED IN AG</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>TRANSACTION PLATFORMS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Product and service marketplaces</td>
<td>Support interactions for the exchange of products and services between buyers and sellers</td>
<td>Help goods and services markets clear through creating connections between buyers and sellers with enabling communications, payment and fulfillment services</td>
<td>izyshop, BigHaat, 8villages</td>
</tr>
<tr>
<td>Social networks and communications</td>
<td>Enable communication between Platform users and/or support exchange of information, images, and comments</td>
<td>Primarily facilitate information or data exchange through providing a medium of exchange. Social networks organize users and make it easier for users to find one another</td>
<td>we farm, Facebook, WhatsApp</td>
</tr>
<tr>
<td>Payment Platforms</td>
<td>Facilitate exchange of payment between different users. Often sector-agnostic and plays an enabling function in transactions within other Platforms</td>
<td>Provide banking and settlement infrastructure to enable users to directly process payments or transfer money</td>
<td>M-PESA, PayPal</td>
</tr>
<tr>
<td>Investment Platforms</td>
<td>Connects investors to investees for equity, loans, or grants</td>
<td>Organizes available capital and funding needs with curation of interactions to help match supply and demand</td>
<td>kiva, thrive</td>
</tr>
<tr>
<td><strong>INNOVATION PLATFORMS</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content Platforms</td>
<td>Enable users to contribute and consume content through a shared (technological) infrastructure</td>
<td>Provide technological infrastructure for the capturing, dissemination and consumption of information</td>
<td>YouTube</td>
</tr>
<tr>
<td>Development Platforms</td>
<td>Provide technology infrastructure that allows consumers to access specific ag-related services and producers to build services, typically apps</td>
<td>Provides technological infrastructure for users, typically app creators, to develop and offer their products to users</td>
<td>Android, iOS</td>
</tr>
</tbody>
</table>

**Notes:**
1. Platform serves as intermediary for direct exchange or transactions. Value driven by interactions;
2. Platform serves as technological foundation upon which other firms develop complementary innovations

A quick guide to reading this report

Although Digital Platforms share these common characteristics, they come in a number of diverse models. In this report, we explore the hype around Digital Platforms in smallholder agriculture and analyze why, despite this hype, the emergence of Platforms in agriculture continues to lag behind other sectors (section 2). We then look at the different types of Digital Platforms—in particular, diving into digital product and service marketplaces to understand their orientation, positioning, and business model characteristics (sections 3 and 4). We pay special attention to the importance of networks in building and sustaining scale, a key component of serving smallholder farmers.

Finally, we examine how the emergence of Digital Platforms might shape smallholder agricultural markets and the broader rural economy (section 5) and outline key considerations for how, as a sector, we should approach the next phase of innovation and growth to account for the opportunities and challenges that Digital Platforms present (section 6).

Note: For the remainder of this briefing note, “Platforms” will be used to refer specifically to “Digital Platforms,” with both terms used interchangeably.
2. THE POTENTIAL OF AGRICULTURAL PLATFORMS

The opportunity to unlock smallholder markets

Globally, Digital Platforms have proven capable of bringing together hard-to-reach buyers and sellers, and facilitating interactions between them in new ways. Platforms like Alibaba in Asia, Mercado Libre in Latin America, and Amazon worldwide enable small- and medium-sized merchants to engage in regional or global trade with minimal or even no investments in their supply chain. In this way, Platforms can optimize the supply and demand of goods and services, helping markets reach equilibrium.

Smallholder agricultural markets have certain structural characteristics that present significant potential for Platforms to add value. The participants in these markets tend to be numerous and highly fragmented, particularly in the case of smallholder farmers and agricultural SMEs. As a result, they are traditionally hard to reach and expensive to serve. They also tend to know little about other participants in the market, creating information asymmetries that fuel distrust and constrain natural connections. These barriers mean that smallholder agricultural markets typically do not clear at all, or do so through multiple layers of intermediaries. These intermediaries, many of them informal, aggregate players, connect various parts of the value chain to one another, and increase market transparency—but they also raise transaction costs.

To further illustrate these constraints, consider the number of smallholder farmers that lack access to markets. It is estimated that smallholder farmers and supply chain actors across developing countries lose an average of 15% of their income to food spoilage. Additionally, around USD 170 billion of the global demand for smallholder farmer finance goes unmet. While there is no comprehensive global sizing of the demand and supply for lending to agricultural SMEs, in sub-Saharan Africa alone the gap is estimated at USD 100 billion annually.

By digitally enabling direct connections between farmers, service providers, and other value chain actors, Platforms can help markets overcome some of these barriers. Much like farmer cooperatives (but on a grander scale), they can aggregate disconnected market participants in a single outlet, reducing or eliminating expensive middlemen. They can also digitize transaction data to help make interactions more efficient and increase overall market transparency. Thus, Platforms have a high potential to disrupt agricultural markets and unlock access to key products and services for millions of underserved smallholder farmers.

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6 Ibid.
Different types of Platforms help clear markets in different ways. For instance, the core function of Innovation Platforms is to provide the technological infrastructure that enables content or software development. Transaction Platforms tend to have a greater focus on organizing, facilitating, and curating interactions—though they may also engage in infrastructure-related activities to enable the exchange of products, services, information, or financial resources.

**Figure 6: Platform functions**

<table>
<thead>
<tr>
<th>Organize and Structure</th>
<th>Facilitate Interactions</th>
<th>Provide Infrastructure</th>
<th>Curate Interactions</th>
<th>Generate and Utilize Data</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>PRODUCER</strong></td>
<td><strong>CONSUMER</strong></td>
<td><strong>PRODUCER</strong></td>
<td><strong>CONSUMER</strong></td>
<td><strong>PRODUCER</strong></td>
</tr>
<tr>
<td>Aggregate and organize fragmented users, making it easier for them to engage with each other</td>
<td>Enforce minimum standards and support Platform users to exchange goods, services and information</td>
<td>Provide physical, human, and/or digital infrastructure that Platform users can use in exchanging goods, services and information</td>
<td>Actively matchmake between users to create interactions where there is more likely to be an exchange of value</td>
<td>Capture, aggregate and analyze interaction and customer profile data, and share these to help Platform users make informed decisions</td>
</tr>
</tbody>
</table>

**Market Outcomes**

- Through a combination of these core functions, Platforms HELP MARKETS CLEAR (i.e., match supply and demand) by:
  - Creating new and/or more interactions
  - Facilitating higher value interactions
  - Creating more efficient interactions
  - Providing data for decision making
- Different kinds of Platforms offer different combinations of these functions, depending on their focus and the needs of the market in which they operate

Source: ISF Advisors and RAF Learning Lab analysis

**The reality of a lagging response**

Despite this potential, Platforms in the agricultural sector have lagged behind those in other sectors by decades. Outside of agriculture, there are Platforms large and successful enough to go public—and, in some cases, to join the S&P 500 (the 500 largest publicly listed American companies). This includes pure-play Platform models like eBay, Facebook, and Etsy, as well as companies with combined pipeline and Platform businesses, like Amazon or Apple. But in the smallholder agricultural sector, Platforms only began to emerge within the last decade. None are publicly listed, let alone valuable enough to rank in the S&P 500.
Until recently, this lag could be explained by the limited digital connectivity experienced by smallholder farmers in remote rural areas. Platforms are digital in nature, and this digital technology is vital to their ability to quickly reach (and hopefully sustain) a scale at which the marginal cost to serve is close to zero. Up to now, the vast majority of smallholder farmers have lacked access to adequate mobile connectivity, making it difficult for them to engage and constraining the growth—and therefore value creation—of Platforms.

Notes: S&P 500 visual adapted from: Moazed, Alex and Nicholas Johnson (2016), Modern Monopolies for figures until 2015, figures updated for 2016–2020 by ISF Advisors.
Despite this progress, developing a viable Platform business model that fits the smallholder agricultural market remains difficult. Platforms tend to thrive where interactions can happen digitally, are largely standardized and unchanging across geographic areas, are consistent over time, and are high in value. Smallholder farming value chains, including production, inputs, offtake, processing, and other functions, tend to be anything but standard; they rely on the unique market and production conditions of each geographic location. Certain crops only grow in specific areas, and inputs and produce are highly crop-specific. This creates hyper-localized networks that limit the ability of Platforms to scale, since expansion to new areas or value chains requires costly customization. Additionally, transaction values are low and erratic due to crop seasonality and market volatility.

Perhaps most importantly, Platforms tend to succeed where the exchange of value does not require intensive physical capital or assets. For example, social networks and shared economy Platforms rely primarily on the underlying digital infrastructure. Alternatively, Platforms can rely on physical enabling infrastructure. Look at successful e-commerce Platforms—such as Amazon, Etsy, or Alibaba—which require access to warehousing, packing, and shipping capabilities. These companies have all brought some of these capabilities in-house, but still rely heavily on the highly developed logistical and delivery infrastructure of third-party providers.
In developing economies, where this infrastructure tends to be weak, the path to viable digital marketplace business models is more challenging. Take, for example, Jumia: Africa’s largest digital marketplace Platform and first unicorn. Despite double-digit customer and revenue growth, in fall 2019 Jumia made the decision to exit Cameroon, Gabon, and Tanzania—all markets with particularly poor delivery infrastructure. Expenses were simply too high to maintain operations.

These barriers are even greater when it comes to serving last-mile smallholder farming communities. Produce (especially perishable food crops) requires storage solutions that are close and affordable enough to be accessed by farmers. Sparsely populated areas require logistic service providers and networks to enable physical exchange of produce and/or services. In the absence of third-party service providers, Platforms serving smallholder farmers often have no choice but to build this enabling infrastructure themselves—the cost and maintenance of which severely limits the viability of these business models. Beyond those barriers, Platforms looking to serve smallholder agricultural markets face challenges in the broader enabling environment in which they operate, including trade policies, price and data regulation, and foreign exchange management.
Figure 8: The agricultural Platform market opportunity and business challenge

<table>
<thead>
<tr>
<th>THE PLATFORM OPPORTUNITY</th>
<th>THE PLATFORM BUSINESS CHALLENGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Many agricultural markets have characteristics that create strong potential for Platforms to help markets clear</td>
<td>There are cost and scale challenges for Platform providers that make it difficult to create viable Platform business models</td>
</tr>
<tr>
<td>✓ Multiple layers of intermediation creates opportunities for disintermediation</td>
<td>✗ Volatile prices, low transaction values and challenging economics for smallholder agriculture creates challenges around capturing sufficient value to sustain the Platform</td>
</tr>
<tr>
<td>✓ Numerous and fragmented market participants creates opportunities to facilitate interactions in more efficient ways</td>
<td>✗ Geographically unique and seasonal production and trade creates the need to customize the Platform to different users and manage seasonal demand that limits scalability and increases the cost of service</td>
</tr>
<tr>
<td>✓ Opaque and underused market information creates opportunities for digital data to enable more efficient interactions</td>
<td>✗ Highly seasonal production and trade creates challenges for managing seasonal demand and maintaining user engagement</td>
</tr>
<tr>
<td>✓ Digital connectivity of market participants creates opportunities to introduce new digital connection points in the exchange of value</td>
<td>✗ Capital intensive and limited last-mile transport, storage and communications infrastructure needed to facilitate the exchange of value creates the need for many Platforms to directly invest in this enabling infrastructure, limiting the viability of their models</td>
</tr>
</tbody>
</table>

TAKEAWAY: While the structure and dynamics of the smallholder agricultural market are conducive to the emergence of Platforms, the nature of the interactions between participants creates significant challenges that often constrain Platforms’ ability to cost-effectively build and scale their businesses.

Notes: Analysis presented is a generalization of many smallholder-related agricultural markets. It is important to understand differences in I) some highly organized cash crops that are anchored by large, export-oriented buyers; II) some agricultural supplies markets that are controlled by large input companies; III) some highly-localized commodity markets where market participants are geographically concentrated.

Source: ISF Advisors and RAF Learning Lab analysis

Acknowledging Market Nuances

While the characteristics discussed above hold for the majority of smallholder agricultural markets, it is important to acknowledge key differences in both particular markets and in Platform types—as well as how these differences might affect why and when Platforms emerge.

Platforms tend to emerge and thrive in fragmented industries where they are able to aggregate disconnected players and remove expensive gatekeepers. While this describes most smallholder markets, there are some that are able to clear more effectively and thus may be less ripe for disruption. For example, highly organized cash crop markets like coffee are anchored by large, export-oriented buyers with close existing connections to farmer groups or cooperatives. Where there is a high concentration of players on one side of the market, the need for Platform models is less obvious. In some ways, the emergence of Platforms might even pose a threat to dominant incumbents. The same applies to crops where trade and consumption happens very close to the farm-gate and buyers and sellers are more likely to create natural connections without the need for digital facilitation.

Relatedly, certain types of Platforms are impacted by market characteristics differently than others. For instance, the presence of enabling physical market infrastructure is fundamental for product and service marketplaces, which often involve physical exchange. However, this infrastructure is not critical for social networks and communications Platforms, which can operate over digital infrastructure.
3. EMERGING TYPES OF AGRICULTURAL PLATFORMS

Market opportunity has fueled the rise of many different types of Platforms in the agricultural sector. As mentioned in Section 1, the literature distinguishes between two overarching Platform types: innovation and transaction. Based on the orientation of the Platform, Innovation Platforms can be content-related (e.g., YouTube) or development-related (e.g., iOS or Android). Similarly, Transaction Platforms can vary based on the transaction being enabled; they can be product and service marketplaces, social and communications networks, or payment/investment Platforms.

In this report, we focus primarily on product and service marketplaces because this is where we have seen the most investment and business model innovation within the agricultural sector over the last several years. Most of these product and service marketplaces aim to connect smallholder farmers with agricultural buyers or product/service providers so they can access a variety of inputs, loans, advisory services, and markets. By contrast, other Transaction and Innovation Platforms—though increasingly being leveraged in the agricultural sector—are not solely focused on agriculture. Most are existing Platforms that have functioned for years in other sectors and are now capitalizing on mobile penetration into rural areas. Some product and service marketplaces explored in this report utilize other communication Platforms (e.g., WhatsApp) and payment Platforms (e.g., mobile money providers) to enable the exchange of goods and services.

Note: For the remainder of this report, “product and service marketplaces” will be used interchangeably with “agricultural marketplaces.”
Figure 9: Taxonomy of Digital Platforms

<table>
<thead>
<tr>
<th>TYPES OF DIGITAL PLATFORMS</th>
<th>EXAMPLES USED IN AG</th>
<th>NATURE OF USE IN AGRICULTURE</th>
<th>EXTENT OF USE</th>
<th>AG SPECIFIC</th>
<th>RESEARCH FOCUS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transaction Platforms</td>
<td>Product and service</td>
<td>Many agriculture-specific</td>
<td>High, rapidly</td>
<td>Many new,</td>
<td>Deep dive</td>
</tr>
<tr>
<td></td>
<td>markets</td>
<td>marketplaces and</td>
<td>growing</td>
<td>ag specific</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>exchanges emerging</td>
<td></td>
<td>Platforms</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Social networks</td>
<td>Ubiquitous, established</td>
<td>Medium,</td>
<td>Typically</td>
<td>Light review</td>
</tr>
<tr>
<td></td>
<td>and communications</td>
<td>Platforms being used by</td>
<td>rapidly</td>
<td>application</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>value chain actors to</td>
<td>growing</td>
<td>of existing,</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>communicate and coordinate</td>
<td></td>
<td>sector</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>exchange; few ag.</td>
<td></td>
<td>agnostic</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>specific Platforms</td>
<td></td>
<td>Platforms</td>
<td></td>
</tr>
<tr>
<td>Payment Platforms</td>
<td></td>
<td>Some established payment</td>
<td>High / low</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Platforms integrated into</td>
<td>depending on</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>marketplaces but</td>
<td>region</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>typically linked to another</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>service facilitating</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Investment Platforms</td>
<td></td>
<td>Limited use of some</td>
<td>Very little</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>established investment</td>
<td>application</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>exchanges for larger ticket</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>size deals; largely</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td></td>
<td></td>
<td>curated and typically</td>
<td></td>
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<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>involve active matchmaking</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Innovation Platforms</td>
<td>Content Platforms</td>
<td>A number of providers using</td>
<td>Medium,</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>established content</td>
<td>rapidly</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Development Platforms</td>
<td>Platforms to deliver</td>
<td>growing</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>advisory services</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


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**CLARIFYING DISTINCTIONS: “SUPER-PLATFORMS” AND “GOVERNMENT PLATFORMS”**

Over the last couple of years, two additional specific Platform references have emerged:

- **“Super-Platforms”** refer to Platform models that reach a certain scale (e.g., more than one million farmers) or breadth of services.\(^{13}\) While this term has gained traction in certain parts of the industry, we believe it should be revisited in light of the clarity and taxonomy presented in this research.

- **“Government Platforms”** refer to large digital programs run by government institutions. Early examples—including KALRO, ATA, and the Cellulant-run network in Nigeria—aim to provide data, inputs, and services directly to farmers. While digitally enabled, these so-called “platforms” more closely resemble a pipeline business model; in the context of this report, we would consider these digital solutions rather than Digital Platforms.

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Agricultural marketplaces: a growing segment

Over the last few years, agriculture-specific product and service marketplaces (which we will also term “agricultural marketplaces” in this report) have proliferated. Today, there are at least 76 agricultural product and service marketplaces operating across Africa, South and Southeast Asia, and Latin America. Almost 40% of these marketplaces are concentrated in sub-Saharan Africa, particularly East Africa. This geographic focus is largely explained by donor and impact investor priorities. Inspired by the widespread adoption of mobile phones and mobile money in the region, funders are investing heavily in Platform business models that might be able to address key market challenges in smallholder agriculture.

In Asia, the majority of product and service marketplaces are found in India (almost 30% of all marketplaces profiled). This is driven by the country’s large market and by government support for market-based solutions that connect farmers with value chain actors and service providers. India-based product and service marketplaces are relatively mature compared to Platforms in other geographies, and many have raised large amounts of commercial funding—several rounds of funding in the case of some of the largest players.

Latin America, with 24% of all studied marketplaces, lags behind in relative terms. While this report does not interrogate these marketplaces in depth, we hypothesize that the relatively small scale may be due to a number of factors. These include differences compared to Africa and Asia in the relative density of smallholder farmers in the market (11 million in Latin America versus 190 million in Southeast Asia), higher levels of urbanization, lower levels of donor activity, higher presence of cash crops, and more active participation from government in product and service provision.

Interestingly, most identified Platforms operate in only one country: under 25% operate regionally and only four operate on more than one continent.

Though high in number, most of these marketplaces remain small in size. Among those for which we have scale numbers, less than a third are currently reaching more than 100,000 farmers and only 10% have surpassed the one million farmer milestone. As mentioned, the majority of these large Platforms are concentrated in India and most are operated by new, tech-based companies (a couple of exceptions being the government-run E-NAM and ICT’s E-Choupal). Outside of India, only Safaricom in Kenya has managed to reach more than one million farmers through its DigiFarm Platform.

The rest (70% of all models with data on scale) serve less than 100,000 users but still vary significantly in scale. Some have gained enough traction to reach tens of thousands of farmers—for example, Farmster in Kenya and India or TroTro Tractor in Ghana. Others only reach several hundred farmers, and are often still in the piloting phase.

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14 Excludes China-based Platforms, except for Rural Taobao.
For this report, we have measured Platform scale by considering the number of farmers using the Platform. This comes with some caveats. For some Platforms—especially those that also facilitate B2B interactions (such as logistics or insurance marketplaces)—the number of farmers using the Platform is not the only or most relevant measure of scale that should be used. In addition, many Platforms facilitate multiple types of interactions, from finance and market access to inputs, and the number of users varies between these different interactions. Generally speaking, Platforms tend to report the highest figure.

Most consequentially, it is important to distinguish between registered and active users of the Platform. In most cases, Platforms make data available on the former and not the latter. Even where active users are reported, there is often no consistency on what constitutes an active user (i.e., what level and frequency of activity is required). Figures on scale are self-reported data and are most likely to refer to registered users.

In addition to the scaling challenges that Platforms face (as discussed in Sections 2 and 4), this relatively large number of small Platforms reflects the maturity level of the market itself. The emergence of product and service marketplaces into smallholder agriculture is still in its infancy. More than 75% of marketplaces are less than five years old, and there is a constant flow of players entering and exiting the market as they experiment with new business models. Proliferation of pilots is characteristic of innovation efforts across all industries, and might be particularly necessary to spur creativity that addresses challenges in the smallholder agriculture markets. However, it is likely that—just as we see in the tech industry more broadly—many of these pilots will die out and there will be an eventual market concentration into a smaller number of players.
Figure 10: The rise of agricultural product and service marketplaces

Notes:
- Analysis has been done on 76 product and service marketplaces with operating in smallholder-related agricultural markets (excluding digital solutions and coordination initiatives); data on scale not available on 4 profiled models. Smaller and more recently-emerged Platforms have not in all cases been captured.
- Many more Platforms exist in developed agricultural markets. These are out of scope of our research, which focuses on agricultural Platforms active in smallholder-dominated agriculture.
- The Chinese market has not been included in this research, despite the existence of a large number of Platforms operating in rural areas.

Source: ISF Advisors and RAF Learning Lab analysis
The Indian agricultural tech market is unique and large, with over 600 active tech start-ups and over USD 1.7 billion of deals between 2014 and 2019. India-based Digital Platforms that we profiled serve, on average, over 700,000 farmers—nearly six times more than the average African Digital Platform. We identify four drivers of this relatively high activity and maturity:

**Scale of the opportunity**
As a market, India represents a huge opportunity for Platforms: the country is home to 146 million farms, 166 million hectares of arable land, a total population of 1.3 billion, and 43% of its workforce is employed in agriculture. On the demand side, population growth, urbanization, and increasing prosperity create a need for transformation of the agricultural sector. This is complemented on the supply side by the proliferation of small farms with productivity rates well below their potential. The public extension system does not have the capacity or resources to meet the growing needs of farmers. At the same time, many of the challenges in the sector (e.g., inefficiency in supply chains, information asymmetries) lend themselves well to Platform solutions.

**Public sector support for agricultural tech start-ups**
At both the central and state government levels, there is a heavy focus on supporting agricultural tech start-ups. The central government aims to double farmer incomes by 2022, and a key part of its strategy is to promote entrepreneurship by reducing regulatory barriers, facilitating learning and development, promoting collaboration, and providing a number of incentive schemes to start-ups. Since 2016, when the central government launched the Startup India initiative, the majority of Indian states have actively started supporting agricultural tech start-ups.

**A supportive ecosystem**
There is a healthy ecosystem supporting Indian tech start-ups, with over 250 accelerators, 1,500 investors, 55,000 tech start-ups, and 26 unicorns. Among the incubators and accelerators, several are focused on agriculture specifically, such as ICRISAT, CIIE, and NAARM. Likewise, among the various investors, a number focus specifically on agriculture. Several start-up hubs have emerged in areas where a supply of technical talent exists (for instance, near Indian Institutes of Technology) alongside an ecosystem of mature tech companies and start-ups. Finally, there are many high quality publications regularly assessing the state of the sector in India, providing a basis for understanding and decision making.

**Fast increases to digital penetration**
There is a relatively high and fast increasing availability of digital infrastructure in India, including the growth of mobile phone and Internet access. For instance, high-speed Internet is becoming more available and accessible to rural populations, 57% of whom use the internet daily. This creates opportunities for agricultural tech start-ups to reach or facilitate access to rural communities using digital means.

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*Box continues on next page.*
KENYA

Kenya has just under 4% of Africa’s population and an agriculture sector which, while important in terms of employment and GDP contribution, is not vastly different from other African countries. Nonetheless, the country accounts for nearly 25% of agricultural tech start-ups in Africa. East Africa, with Kenya in the lead, is home to half of the headquarters of agriculture-related digital solutions that are active in Africa and more than two-thirds of registered users. Over 100 agriculture-related digital solutions are present in Kenya and an estimated 20-30% of Kenyan farmers make use of at least one digital solution. Out of our profiled Digital Platforms in Africa, more than half are based in Kenya. We believe this to be primarily driven by three factors:

Presence and adoption of digital technologies
Compared to many other African countries, Kenya has strong mobile and digital access, connectivity, and adoption. GSMA scores Kenya’s mobile connectivity as among the top five in sub-Saharan Africa. The country was among the first African markets where mobile money was developed, pioneered by Safaricom’s M-Pesa; currently, mobile money is used by over 72% of the rural population. Many enterprises—including pipeline businesses and Platforms, and both traditional and digital enterprises—build or rely on mobile money solutions. This foundation of existing digital solutions and mobile and digital connectivity provides a fertile ground for Digital Platforms.

Regulatory environment supportive of private sector
The World Bank scores Kenya high in its Ease of Doing Business and Enabling the Business of Agriculture rankings, with the country ranked among the top three most attractive business environments in Africa in both of these indices. The government actively plans to shift farmers online, both through the adoption of digital solutions in public extension and by becoming an attractive environment for businesses, entrepreneurs, and talent.

Presence and activity of donors
Many digital solutions and Digital Platforms in Africa receive support from donors—and among these, most donor programs launch or pilot in Kenya. The country receives high amounts of Official Development Assistance, placing consistently among the four largest recipients in Africa, in absolute terms. Virtually all major development organizations have a presence in Kenya, and in many cases their (East) African headquarters are in Nairobi. The presence of development organizations and donors in Kenya plays a catalytic role, supporting many agricultural tech enterprises with technical assistance, grant financing, and other kinds of support. This creates a space for development and piloting of innovative new digital and Platform business models.

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Understanding emerging types of agricultural marketplaces

As the number of product and service marketplaces grows, so does the complexity of the market. This underscores the need for a new taxonomy that helps stakeholders understand the unique characteristics of different marketplace types. To that end, we distinguish first at a very basic level between product, service, or integrated marketplaces. Differentiating between products and services is particularly important when it comes to digital marketplaces because services do not require a physical exchange of goods. This lessens the need of service marketplaces for capital-intensive physical infrastructure, making their path to scale relatively easier. Beyond these top-level distinctions, we distinguish eight broad types of marketplaces based on the object of exchange, as depicted in figure 11.

**Figure 11: Types of product and service marketplaces**

<table>
<thead>
<tr>
<th>TYPE OF MARKETPLACE</th>
<th>OVERVIEW</th>
<th>KEY INTERACTIONS</th>
<th>NEW PROVIDER</th>
<th>PRE-EXISTING AG PROVIDER</th>
<th>PRE-EXISTING NON-AG PROVIDER</th>
<th>EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Ag Supplies Marketplace</td>
<td>Digital marketplace for farm supplies and inputs</td>
<td>• Purchase of production inputs and farm supplies</td>
<td>5</td>
<td>1</td>
<td>-</td>
<td>AgroStar</td>
</tr>
<tr>
<td>2. Produce Marketplace</td>
<td>Retail trading Platform that connects farmers with consumers and small retailers</td>
<td>• Sale of farm produce</td>
<td>21</td>
<td>2</td>
<td>1</td>
<td>izyshop</td>
</tr>
<tr>
<td>3. Combined Ag Supplies and Produce Marketplaces</td>
<td>Digital marketplace for facilitating offtake as well as access to farm inputs (i.e., farmer sells and buys)</td>
<td>• Purchase of production inputs and farm supplies • Sale of farm produce</td>
<td>8</td>
<td>-</td>
<td>-</td>
<td>farmcrowdy</td>
</tr>
<tr>
<td>4. Trading Marketplace</td>
<td>Wholesale trading Platform that connects buyers and sellers for agricultural produce</td>
<td>• Sale of farm produce</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>grão direto</td>
</tr>
<tr>
<td>5. Integrated Farm Services Marketplace</td>
<td>Integrated farm support marketplace that provides a combination of supplies, production support, finance and offtake services</td>
<td>• Purchase of production inputs and farm supplies • Support services for agricultural production • Farm finance and insurance • Sale of farm produce</td>
<td>12</td>
<td>4</td>
<td>3</td>
<td>Lima Links</td>
</tr>
<tr>
<td>6. Farm Services Rental Marketplace</td>
<td>Marketplace that connects distributed asset owners and farmers to support on-farm production</td>
<td>• Support services for agricultural production</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>TROTRO Tractor Limited</td>
</tr>
<tr>
<td>7. Transport and Logistics Marketplace</td>
<td>Marketplace that connects transport and logistics companies (typically sector agnostic) with farmers</td>
<td>• Transport of farm produce</td>
<td>4</td>
<td>-</td>
<td>-</td>
<td>TaniSupply</td>
</tr>
<tr>
<td>8. Insurance Marketplace</td>
<td>Marketplace for insurance (typically multi-sector)</td>
<td>• Production related insurance</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>GramCover</td>
</tr>
</tbody>
</table>

Source: ISF Advisors and RAF Learning Lab analysis
Understanding market positioning and the participation of smallholder farmers

It is useful to distinguish between different types of product and service marketplaces in order to reach a more nuanced understanding of where they play, through what business models, and why. With the exception of marketplaces involving access to agricultural supplies, product marketplaces tend to play further down the value chain, facilitating access to local buyers, wholesalers, retailers, and/or direct consumers. Hybrid integrated marketplaces, on the other hand, often play across the entire value chain, complementing access to markets with supporting services, such as trade finance or storage. In contrast, service-only marketplaces operate further upstream, focusing on pre- and post-production-related services, such as mechanization, transport, and insurance.

**Figure 12: Market positioning of product and service marketplaces**

<table>
<thead>
<tr>
<th>Input supply &amp; pre-production</th>
<th>Production</th>
<th>Post harvest &amp; transport</th>
<th>Trading &amp; marketing</th>
<th>Wholesale</th>
<th>Retail &amp; consumption</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1. Ag Supplies Marketplace</strong></td>
<td><strong>2. Produce Marketplace</strong></td>
<td>Disintermediating trade</td>
<td>Curating agriculture supplies access for small producer needs and aligning trade</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3. Combined Ag Supplies and Produce Marketplace</strong></td>
<td><strong>4. Trading Marketplace</strong></td>
<td>Disintermediating trade</td>
<td>Curating interactions around small producer needs and aligning trade</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>5. Integrated Farm Services Marketplace</strong></td>
<td><strong>6. Farm Services Rental Marketplace</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7. Transport and Logistics Marketplace</strong></td>
<td><strong>8. Insurance Marketplace</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: ISF Advisors and RAF Learning Lab analysis
Different marketplaces facilitate different types of interactions, with farmers playing the role of producer or consumer (or both at the same time). Produce marketplaces operating downstream engage farmers as producers. Fragmented and sparsely distributed farmers are brought into one single Platform to sell their crops, fruits, vegetables, and livestock wholesale to local traders, agro-processors, and in some cases directly to consumers. Ag supplies and service-only marketplaces, on the other hand, engage farmers as consumers. In these marketplaces, farmers can purchase inputs or insurance, rent tractors, or contract transportation services.

Finally, within integrated service marketplaces, farmers are engaged as both producers and consumers, enabling various types of interactions in one single Platform. While integrated service marketplaces can address multiple market failures simultaneously, facilitating various types of interactions within one Platform creates unique operational complexities for the Platform operator. These intricacies can be challenging for many marketplaces that seek to operate under one brand and a single business model.

Perhaps unsurprisingly, more than one-third of all product and service marketplaces we identified are either combined ag supplies and produce marketplaces (8 Platforms) or integrated farm services marketplaces (19 Platforms). Both categories focus on interactions both to and from the farm—products and services go to the farmer and market access for farm produce is available at harvest time.

A majority of smallholder farmers lack—and urgently need—access to a comprehensive package of both products and services that enable them to increase productivity (e.g., through inputs, often on credit, and/or mechanization services) and to translate these productivity gains into increased income (e.g., by accessing markets and better prices). This need for broader, more holistic smallholder farmer support has been well documented in previous ISF and RAF Learning Lab research, including our latest state of the sector report, Pathways to Prosperity. Providing a “one-stop shop” featuring holistic services may also strengthen the impact case and, therefore, the value proposition of these Platforms. This could increase business model sustainability through cross-subsidization of lower-margin services—for example, inputs—with higher-margin activities like produce brokering. As marketplaces continue to evolve their offerings in the agricultural market, we expect more bundling of complementary or enabling services within a single Platform.

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ISF Advisors and Mastercard Foundation Rural and Agricultural Finance Learning Lab (2019). Pathways to Prosperity. pathways.raflearning.org/
Who operates platforms?

Broadly speaking, there are four types of players that have set up agricultural Platforms:

1. **Technology start-ups developing innovative Platform business models.**
   Inspired by the example of Platforms in other sectors and the rapid digitization of the agriculture sector, tech start-ups have developed a wide range of agricultural Platforms with the aim of establishing profitable businesses. For example, Agrocenta in Ghana offers various Platform functions and digital solutions to connect farmers and businesses—this start-up has attracted a number of investors.

2. **Agricultural pipeline businesses adding Platform functions to their model.** For these businesses, leveraging their existing position in the market to facilitate interactions as a Platform can benefit their core business and/or provide them with a promising new business model from which to generate additional revenues. For instance, E-Choupal is run by the large commodities trader ITC and is intended both to empower farmers and improve their access to agricultural goods and services from a variety of businesses, while making the supply chain more efficient, thereby reducing procurement costs and complexity for ITC.

3. **Government or development actors operating Platforms for the public good.** Especially in contexts where market-driven dynamics are ill-suited for meeting the needs of vulnerable population subsegments (e.g., subsistence farmers, women, youth), public or development actors may set up Platforms with impact-oriented aims. Catalogo de Productos Agropecuarios is a produce marketplace operated by the Ministry of Agriculture of Peru. The Platform is free to use and connects vulnerable smallholder farmers to off-takers and final consumers to sell their agricultural produce.

4. **Operators of existing businesses in adjacent industries.** The smallholder agriculture sector is, to a large extent, an untapped market; it is therefore attractive to businesses active in adjacent sectors, which believe they have the resources, capabilities, networks, relationships, or other assets to succeed in this market, and are often already serving farmers for non-agricultural needs. For these players, setting up an agriculture-specific Platform represents the opportunity to participate in a new market. DigiFarm and EcoFarmer are two examples of mobile network operators (MNOs) using their existing relationships with customers and digital infrastructure to enter the agriculture space.

By far, the most common type of Platform operator that we identified in the agriculture sector was tech start-ups, which represented 75% of the Platforms across all types of marketplaces. There are a few reasons why this might be the case. First, Platform business models are vastly different than pipeline business models, requiring a mindset shift that can be tricky to navigate for existing pipeline businesses (but less so for tech start-ups). Successfully running a Platform requires gaining the trust of both sides of each interaction. Here, tech start-ups may also have an advantage, as they can more easily position themselves as neutral facilitators and arbiters, rather than actors with a significant stake in the interactions or who may even be a direct competitor to potential Platform users. Additionally, the economics of agricultural Platforms are challenging; while there is much potential, it is a risky venture better suited to tech start-ups.
Tech start-up Platforms tend to have high degrees of innovation and churn, but vary in their scale. While several serve over 500,000 farmers, two-thirds of these emerging Platform operators reach fewer than 100,000 farmers. On average, they are three to four times smaller than Platforms run by mobile network operators or agribusinesses. How many of these emerging Platforms will outlive their product-market fit testing stage will depend on how quickly they can reach and sustain a large enough scale to create value to users without running out of cash.

More established players—such as large agribusinesses or mobile network operators—tend to focus on two types of marketplaces. The first is integrated farm services marketplaces (such as DigiFarm, FtMA, and Rural Taobao), where large operators can leverage their existing infrastructure, brand, and customer base to set up higher-touch models, cross-subsidize, deploy capital needed to scale, and more quickly onboard users on both sides of the market across a variety of interaction types. The second is asset sharing marketplaces (such as Tringo and JFarm), where operating a Platform can benefit the core pipeline business.

**PREDICTION: The rise of Platforms in tight value chains**

As outlined in this report, Platforms are most likely to appear in sectors where actors are highly fragmented and significant inefficiencies exist that limit market interactions. Unsurprisingly, many of the current Platforms in agriculture have either focused on looser value chains with relatively large numbers of actors (not only on the farmer side but also on the side of offtakers) or have taken a relatively value-chain-agnostic approach (e.g., ag supplies marketplaces), where the positive transformative potential of Platforms is relatively high. Many agricultural value chains, however, are characterized by a relatively high degree of business consolidation—in particular, vertically integrated agribusinesses. These businesses often play a large role in goods and service provision to the smallholder farmers from whom they source, whether on an impact-focused or more commercially minded basis.

In these types of value chains, we expect the dynamics of agricultural Platforms to differ. Platforms are less likely to add value for agribusinesses by structuring and organizing commodity transactions (e.g., produce and trading marketplaces), as these are currently based around vertical integration and tight relationships between farmers and offtakers. In fact, agribusinesses might see Platforms as rivals and, given their relatively high degree of power, might impede the emergence of Platforms in these value chains.

Given their position, agribusinesses might build on their existing relationships, knowledge, human capital, and physical infrastructure to create their own Platform businesses alongside their core pipeline operations. A number of agribusinesses are already incorporating digital solutions into their business (e.g., Cargill CocoaWise). We hypothesize that a number of such businesses may explore the Platform option, allowing them to facilitate and oversee interactions without needing to directly provide all the goods and services they are currently delivering.

In some cases, tight value chains are closely regulated, limiting the amount of market-based innovation that Platforms can offer. For instance, in Ghana, only licensed buying companies may procure cocoa from farmer organizations; in Vietnam, only local businesses may purchase coffee from farmers. Within other value chains, public entities are often directly involved in marketing activities, setting commodity prices, and/or providing supplies and services as part of free or subsidized programs. Here, too, the opportunities for Platforms to add value are limited.

On the other hand, while many agribusinesses currently provide a range of goods and services to smallholder farmers from whom they source (particularly in tight value chains around export-oriented crops), they often see their service delivery models as part of the cost of doing business rather than a core part of it. As such, a subset of agribusinesses may welcome the emergence of goods and service-focused Platforms—whether operated independently or by themselves—as a way for them to focus on their core business of procurement, processing, and trading while leaving service delivery to other market actors.

In summary, while relatively few Platforms have emerged with a specific focus on tight value chains, we can imagine multiple future scenarios of how such an emergence might reshape market dynamics in those value chains.
Beyond marketplaces

While product and service marketplaces represent the bulk of agriculture-specific Platforms to date, there are three other types of Platforms that—despite not being limited to the sector—play an important role in agriculture.

**Communications Platforms and social networks**

Communications Platforms and social networks specifically for the agricultural sector are rare. However, many pipeline and Platform businesses use existing communications and social networks (e.g., WhatsApp, Facebook) to communicate with farmers or set up community forums. Additionally, farmers themselves use these networks to communicate peer-to-peer, share advice and market info, and connect with off-takers and farmer groups. Smallholder farming groups on Facebook are popular: The African Farmers Community (over 500,000 members) and African Farmers Club (over 150,000 members) are widely used by farmers for sharing agricultural practices, market opportunities and prices, and recommendations on providers.

This leveraging of existing Platforms tends to be effective because farmers prefer to use social media and messaging Platforms that they are already familiar with instead of engaging with new channels. Social and communications networks are also harder to monetize, particularly among smallholder farmers who are not often willing to pay for advisory services. WeFarm is one popular agriculture-specific Platform that leverages an existing network (WhatsApp) to enable peer-to-peer advice sharing between smallholder farmers. The network, which has reached over one million farmers in East Africa, is now expanding its services by facilitating access to agricultural inputs.

**Payment Platforms**

As discussed in Section 2, there has been a rapid increase over the last five years in the rural penetration of digital payments. This increase has often been driven by the expansion of existing sector-agnostic Platforms, such as mobile money services, into smallholder markets. Payment Platforms are most often integrated into both pipeline and Platform businesses, with users rarely realizing that they are engaging with two different organizations. For example, mPesa is used for financial transactions made through the DigiFarm Platform, which is run by Safaricom in Kenya. Similarly, both BigHaat (India) and Agrofy (several Latin American countries) use third-party digital finance solutions to facilitate transactions made on their Platforms.

Payment Platforms are commonly used by farmers to purchase inputs, make payments on rental equipment or loans, and receive payment for produce. For example, PAYGO (Pay As You Go) solar systems often use local mobile money payment Platforms. Similar payment infrastructure is used by many agro-dealers, government input subsidy schemes, and microfinance savings groups.

Despite the increasing popularity of payment Platforms, significant challenges remain. Many farmers prefer cash-based transactions and many remain unbanked. For produce sales, farmers often prefer being paid on the spot; thus, connectivity and speed are essential for any digital payment option. While the use of payment Platforms in smallholder agriculture is prevalent in certain geographies (e.g., in Kenya, where M-Pesa mobile money payments are highly popular), in other geographies (like Nigeria) it is marginal.
Investment Platforms

In the agricultural sector, investment Platforms connect small-scale investors (typically individuals) with farmers in search of capital. The transaction usually involves small, short-term loans to farmers who are cash-strapped at the beginning of the planting season. These loans are typically used for inputs, equipment, land, and/or crop diversification, and usually carry zero or low interest rates. The revenue model for investment Platforms specific to smallholder agriculture is the same as for non-agriculture investment Platforms, relying mainly on transaction fees.

Smallholder investment models tend to be tech start-ups whose core offering is underpinned by a crowdfunding Platform. Most models are similar in their use of technology and their singular focus on facilitating investment. However, they differ in the type and degree of curation and facilitation. In general, on the investor side, all of these Platforms are open—meaning investors are not actively screened or selected. On the investee side, however, most Platforms actively curate and/or manage their featured farmers. For example, Indonesian peer-to-peer lending Platform Crowde originally intended to connect consumer investors to farmers, but has more recently expanded into a broader range of facilitated services. Crowde now works directly with input providers to pay loans to farmers via in-kind inputs rather than cash. Offtake agreements are facilitated and tied to loan repayment, and the Platform offers training to farmers—all of which is aimed at increasing the likelihood that loans will be invested productively and that risk to the lender is minimized. Many investment Platforms employ field staff to recruit and actively support farmers in deploying their loans productively (e.g., Thrive Agric in Nigeria) or require farmers to apply in order to borrow money through the Platform (e.g., Agrapp and Bayseeddo). We identified one agriculture-focused investment Platform—PlusPlus—that operates similar to sector-agnostic Platforms such as Kiva, but which focuses specifically on agricultural SMEs.
4. EVOLVING MARKETPLACE SERVICE DELIVERY MODELS AND CHALLENGES

Unique business model characteristics

As discussed in Section 2, Digital Platforms are fundamentally different from traditional pipeline businesses in terms of how they create and extract value. Pipeline business models typically create value by taking a series of inputs and then producing products or services that they sell for a given price. In contrast, Platform business models create value by facilitating interactions between multiple types of users. In practice, this means that Digital Platform models differ from pipeline businesses in that they:

1. Do not own inventory nor the means of production;

2. Do not manufacture the product or provide the services available in the Platform themselves (with the exception of Platform-specific services that facilitate the exchange, e.g., logistics and delivery services);

3. Do not price the products or services directly (this is done by sellers using the Platform) but instead charge for enabling access to the Platform or facilitating transactions; and

4. Create limited value for users until a critical mass is reached.

These unique characteristics have two fundamental implications for how to build a viable Platform business model. First, the path to critical scale should, in theory, be faster and easier than in a traditional pipeline business. That is because growth is not constrained by high capital investment needs and, once the Platform infrastructure is established, the marginal cost of serving an additional customer becomes close to zero. Second, reaching monetization and profitability may be trickier in a Platform business model since Platforms must generate additional value for buyers and sellers—and must be able to capture part of that value without discouraging users from transacting through the Platform.

With these reflections in mind, in this section we focus on product and service marketplace Platform models. We begin by taking a look at the current diversity in the market and laying out the most important strategic and management choices agricultural marketplaces can make in defining their business model. We then focus on the challenge faced by most models in first reaching, and then sustaining a critical level of scale.

Diverse business models

While most agricultural product and service marketplaces have common characteristics, there is wide variation in how operators design and manage their service delivery models to facilitate the exchange of agricultural goods and services. This ranges from purely digital marketplaces (e.g., Grao Direto in Brazil or Farmster in sub-Saharan Africa) to models with significant on-the-ground human resources and/or physical infrastructure (e.g., Aibono in India or Farmshine...
in Kenya and Malawi), passing through highly curated models (e.g., EthicHub in Mexico or Croper in Colombia), and single or crop-agnostic value chain players. This diversity is due, in part, to the highly localized nature of agriculture, where farmer needs depend strongly on their location and the value chain(s) in which they are active. But it is also driven by the nascent stage of the sector—the industry seems to be in a constant state of experimentation and innovation, with no clear winning models yet uncovered.

Ultimately, defining an agricultural product and service marketplace model comes down to five key strategic and business management choices regarding: 1) who to serve and what market friction to solve, 2) in what value chains and geographies, 3) with what products and services, 4) through what customer engagement model, and 5) using which revenue model. See the Annex for overview of how the different types of marketplaces differ on these characteristics.

1. Who will the marketplace serve and what friction will it solve?

Product and service marketplaces create value by reducing market frictions. At the most fundamental level, most agricultural marketplaces active today focus on bringing farmers and value chain actors together when they would not otherwise be able to connect (or would do so less efficiently). However, different user segments (e.g., offtakers, input suppliers, service providers, or farmers) face an array of additional friction points and needs that agricultural marketplaces must understand and potentially meet. This impacts the range of services facilitated or offered through the Platform, as well as its go-to-market strategy. For example, an agricultural supplies marketplace targeting smaller, more vulnerable farmers may have to facilitate advisory services in order to educate farmers on the use of fertilizers—or enable access to finance if target farmers struggle to pay for the inputs. It may also need to create a network of agents to increase product awareness and train farmers in the use of the Digital Platform to onboard them quickly. A produce marketplace targeting large buyers may need to work with local aggregators that collect produce from multiple farms to meet minimum production volume requirements.

The different core Platform functions outlined in Section 2—aggregate and organize, facilitate, curate, provide infrastructure, and generate and utilize data—are each suited to resolving particular kinds of frictions. In a highly fragmented market with relatively dispersed farmers, a Platform can focus on organizing farmers to reduce the frictions associated with transactions. In a market in which farmers have access to inputs, but do not have enough information to determine the type or quality of inputs needed (for instance, due to counterfeit inputs being sold), curating the types of businesses and products sold through the Platform can add considerable value.

2. In what value chains and geographies will the marketplace operate?

Different value chains and geographies have their own nuances and requirements that marketplaces must consider. For instance, loose value chains and perishable crops tend to be more fragmented at both the farmer and buyer levels with multiple levels of intermediation, creating strong potential for produce marketplaces. But they also tend to be more volatile, have lower transaction sizes, and be primarily cultivated by more vulnerable, less digitally savvy farmers, creating important cost and scale challenges.
In choosing where to operate, marketplaces should also consider the enabling infrastructure. For instance, marketplaces are more likely to emerge in geographic locations and supply chains that have good access to transport links, aggregation points, and storage facilities—particularly if they focus on perishable crops. Finally, agricultural marketplaces must be aware of regulations. The potential of Platforms to help the market clear will be limited in markets and value chains with heavily regulated prices, government-subsidized product or services, larger presence of public actors competing with private enterprise, or regulatory barriers to entry.

Many of the existing product and service marketplaces operate across multiple value chains in order to balance seasonality and maintain trading volumes. But many of these same Platforms started in one value chain or a single service/user type before expanding to others. For instance, Farmster began as a service for farmers to share and receive information before expanding to integrate buyers, allowing farmers to market their produce on the Platform. Likewise, WeFarm is a communications Platform and social network for farmers, but is now marketing itself to businesses looking to reach those farmers already active on the Platform. Selecting where to focus first is particularly important to drive network effects and gain critical mass faster.

3. What core and additional services will the marketplace provide?

The services facilitated and offered by a marketplace will ultimately depend on the friction points the marketplace is trying to solve for its target customers in a given value chain and geography. For example, produce marketplaces’ core services will include marketing and advertising produce, managing fulfillment, and processing transactions—but these Platforms may also provide additional services, such as facilitating aggregation (e.g., Farmshine aggregates farmer produce), providing finance to buyers (e.g., TruTrade provides traders with financing to cover packing, handling, storage, transport, and taxes), and sharing information on pricing (e.g., Mfarm or Mlouma) or business intelligence on expected demand/supply (e.g., Fruban or Aibono).

Of particular importance is the extent to which the marketplace operator facilitates and/or provides transport and logistics services. The limited infrastructure in many rural settings means that most agricultural marketplaces have to invest in capital-intensive transport and
logistics services that increase cost and limit scale. Most smaller-scale operators tend to outsource these services to specialized third-party providers, often at a high cost. For instance, transport and logistics account for more than half of TruTrade’s total costs. Larger-scale operators, on the other hand, often build their own infrastructure, including vehicles, drivers, and storage facilities. More recently, marketplace operators are starting to leverage data and the sharing economy to tap into logistics marketplaces and benefit from the underutilized capacity of other industry players.

**4. How will the marketplace define its customer engagement model?**

Multiple dimensions can define a marketplace customer collaboration model, including the level of curation, the structure of the relationship between the marketplace operator and its users, and the extent of interaction between the operator and users when it comes to service delivery.

Curation refers to the various practices a Platform operator may utilize to build trust and prevent bad behavior from users. Curated marketplaces may restrict who can join and/or what activities users can undertake, impose user authentication, and/or closely monitor user activity to avoid illegal or inappropriate behavior. With trust being one of the key barriers to adoption of digital solutions, most of the agricultural product marketplaces currently in operation involve some level of curation. For example, marketplaces facilitating logistics or aggregation tend to limit sign-ups to certain locations (e.g., TaniHub in specific locations within Indonesia). More niche players (e.g., Bharat Agri or Cultivando Futuro) screen for certain characteristics, such as certified produce or minimum production volumes. Integrated services marketplaces tend to be highly selective, particularly on the providers’ side—for instance, EzyAgric vets suppliers before they can join the Platform.

In addition, on either side—farmer, buyer, or product/service providers—the relationship between the operator and its users can be contracted or not. In a contracted model, the marketplace operator formally contracts with large institutional buyers and/or farmers to offtake and sell products and services at a given time and price, thereby incurring associated transaction risks such as price fluctuations. This is the case for TruTrade, which contracts with both farmers and buyers to broker the transaction, as well as for Izyshop, which collects produce from contracted farmers to ensure large enough trading volumes for buyers. In most agricultural marketplaces, however, the relationship between the marketplace operator and its users is non-binding; the marketplace operator may market and advertise products and services, but users join and interact independently through the Platform. Marketplaces may choose this model if they are targeting bigger, more commercial farmers, or perhaps because they don’t want to incur the cost and risk of brokering produce or services.

Beyond the structure of the relationship, marketplace operators must consider the level of interaction they want or need to have with their target customers. More than half of the agricultural marketplaces profiled in this report have physical infrastructure (e.g., a rural service center or warehouse) and/or employ field agents to support their engagement with farmers. In more than 70% of cases, these human and physical resources are owned/employed by the marketplace itself—though, in other cases, the

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operator relies on dedicated third parties for these assets. Field agents are most often deployed to provide on-the-ground support to Platform operations. For instance, agents may provide advisory services to farmers (e.g., Waycool, Emsika, Farmshine), collect data for the Platform (e.g., 8Villages, Mifugotrade, Aibono), and/or support farmers in accessing the Platform (e.g., Mlouma, Ninayo). Field agents may also provide support with farmer acquisition and onboarding (e.g., Agrocenta, Farmshine, Agrofy, Bloom) or logistics and fulfillment (e.g., TruTrade, DeHaat, AgriBuddy, KrishiHub).

5. How to monetize: what is the marketplace revenue model?

In return for facilitating interactions, marketplace operators will try to generate revenues in multiple ways. Most agricultural marketplaces generate revenue by charging a transaction and/or membership fee for using the Platform or facilitating the exchange itself. Other ways of generating revenue include advertising (e.g., FarmCrowdy, Lima Links, Croper), monetization of data for business intelligence (e.g., BigHaat, AgriBuddy, Ricult), and the provision of supporting services to their users (e.g., TaniHub also generates revenue from its logistics and finance activities that run in parallel to its Platform functions).

For a small number of players, these monetization strategies seem to be paying off—they have been able to reach a critical mass, monetize their user base, and build a strong enough commercial business case (or at least the promise of one) to attract commercial funding, in some cases several rounds of tens of millions of dollars each. This is especially true in the Indian market—with marketplaces such as AgroStar, BigHaat, DeHaat, and TaniHub attracting commercial investment—but also some Africa- and Asia-based Platforms (e.g., AgriBuddy, Farmshine, and IzyShop).

However, for most players, landing on the right revenue model is proving to be tricky. Marketplace operators do not produce or manufacture the products, nor provide the services being sold. The exchange, though facilitated by the Platform, happens between a farmer and a buyer or seller, who exchange a product or service for an agreed price. For a revenue model to be viable, these marketplaces must be solving a large enough market friction to create additional value for users and be able to capture part of that value without discouraging users from joining and transacting through the Platform. So how big is this value when it comes to smallholder agriculture?

In theory, product and service providers gain value from having access to a larger pool of farmers, often at a lower cost. Farmers, in turn, gain value from accessing a wider range of buyers, services, and products—often at better prices—that can increase their productivity and incomes. The more farmers join the marketplace, the more valuable it becomes for product and service providers, and vice versa—creating a virtuous cycle that grows the user base and increases the value created. In practice, however, the low value of many transactions in smallholder agriculture may mean that the excess value created by the marketplace may be too small to share between farmers, buyers, sellers, and the Platform operator. That is, the marketplace may not be able to monetize its functions without absorbing all the value that would otherwise go to its users.

As a result of these challenges, more than one-third of agricultural marketplaces are partly (e.g., Selina Wamucii, HelloTractor, EzyAgric) or primarily (e.g., Ninayo, La Finca Agropecuaria, E-NAM) subsidized by government, donor,
or sub-commercial funding. Other Platforms are cross-subsidized by their operators’ other businesses—for example, agribusinesses generating offset and export revenues (e.g., EthicHub) or tractor equipment manufacturers (e.g., JFarm, Trringo) running and operating an equipment rental marketplace beside their core business. Given the nascent nature of agricultural marketplaces, it remains unclear what revenue model—or combination of models—works best, and in what contexts. But whatever monetization strategy is used, marketplace funders and operators should ask two fundamental questions: 1) Are farmers, buyers, and service providers gaining value from the interactions happening on our Platform? and 2) Can we capture part of that value without discouraging users from joining and transacting through the Platform?

**Figure 13: Key strategic choices for defining an agricultural marketplace business model**

<table>
<thead>
<tr>
<th>STRATEGIC DIMENSION</th>
<th>KEY QUESTIONS TO CONSIDER</th>
<th>STRATEGIC CHOICES AND EXAMPLES</th>
</tr>
</thead>
<tbody>
<tr>
<td>WHO: target customer and problem solved</td>
<td>• Who is the marketplace trying to serve and what market friction is it solving?</td>
<td>Niche  (e.g., DigiFarm)</td>
</tr>
<tr>
<td></td>
<td>• How do market frictions vary by customer segment and what does this mean for how the marketplace designs and delivers its services?</td>
<td>TIONAGrow (e.g., Mass)</td>
</tr>
<tr>
<td>WHERE: value chain and geographies</td>
<td>• What are the value chain-specific nuances (e.g., market fragmentation, volatility, transaction values) that will impact the marketplace design and unit economics?</td>
<td>Local (e.g., geospecific)</td>
</tr>
<tr>
<td></td>
<td>• How favourable is the local enabling infrastructure (e.g., last mile logistics) and what are the implications on the service delivery model?</td>
<td>Global (e.g., agnostic and global)</td>
</tr>
<tr>
<td>WHAT: service offering</td>
<td>• What mix of core (e.g., marketing, fulfilment, transaction processing), and additional services (e.g., finance, advisory services, logistics) should the market provide to offer an attractive value proposition?</td>
<td>Core (e.g., services only)</td>
</tr>
<tr>
<td></td>
<td>• How should the marketplace facilitate last mile logistics (e.g., in-house, through third party providers or through logistic Platforms)?</td>
<td>Holistic (e.g., add services, incl. logistics)</td>
</tr>
<tr>
<td>HOW TO ENGAGE: customer engagement model</td>
<td>• How much should the marketplace curate who enters the marketplace and how should farmers and businesses engage?</td>
<td>Open (e.g., anyone can join and engage)</td>
</tr>
<tr>
<td></td>
<td>• How should the relationship between the marketplace operators, farmers and businesses be structured?</td>
<td>Closed (e.g., only certain approved users can join)</td>
</tr>
<tr>
<td></td>
<td>• What level of interaction does the marketplace operator want or need to have with its target farmer customer?</td>
<td>Unbinding (e.g., users engage independently)</td>
</tr>
<tr>
<td>HOW TO MONETIZE: revenue model</td>
<td>• How much excess value is the marketplace creating for farmers and businesses?</td>
<td>Contracted (e.g., platform contracts with farmers / businesses)</td>
</tr>
<tr>
<td></td>
<td>• How can it capture part of that value without discouraging users from joining the marketplace?</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• How much funding runway does the marketplace need until it reaches breakeven and what should the funding model be?</td>
<td>Low (e.g., minimal touch points with farmers)</td>
</tr>
</tbody>
</table>

Source: ISF Advisors and RAF Learning Lab analysis
Building and defending networks

Regardless of how agricultural marketplaces are designed, their long-term sustainability will depend on how fast they can achieve, and how long they can sustain, scale. As for any Platform, reaching a critical mass is particularly important to trigger network effects and achieve demand-side economies of scale, making the marketplace more valuable as the number of users increases. But for agricultural marketplaces, in particular—where transaction sizes and margins tend to be small and there is often a need for large capital-intensive investments—fast growth is also fundamental for driving supply-side economies of scale. This is especially important to enable marketplace operators to break even at the pace private investors demand.

At the same time, Platforms must be careful to guard against growing too fast, as this may lead to negative network effects: improperly-managed growth in Platform users can decrease the value proposition to users by increasing search costs (for Platform users to find each other) or make it more difficult for the Platform operators to effective curate users, thereby lowering the average value of users and their interactions.

Breaking the “chicken and egg” problem

For new Platforms, the key is breaking the “chicken and egg” problem to reach a minimum viable scale. Buyers, agribusinesses, and service providers may only want to join a Platform if there are enough farmers from whom to buy produce and/or to whom they can sell products and services. But at the same time, farmers may only want to join if there are enough buyers to sell produce to, or agricultural goods and/or services providers to buy from. This is a challenge for all Platforms, and particularly for agricultural marketplaces.

First, agricultural marketplaces tend to require a bigger investment in customer acquisition—limited awareness and sparsely distributed users means that digital marketing efforts must often be complemented with human interaction via agents or distribution partnerships. Second, the marginal cost advantages that are characteristic of Platforms as they expand are often not as clear in agricultural marketplaces. The localized and physical nature of agricultural products and services, along with an often weak enabling environment, means that operators must make significant investments in assets, partnerships, or capabilities to serve farmers. This is particularly true for higher-touch models, for which expansion may require establishing new partnerships with local players or increasing agent networks. Finally, transaction Platforms, such as product and service marketplaces, tend to have relatively low barriers to entry—leading many players to overestimate the power of a relatively fast-to-build technology Platform and underestimate the challenge of building a large-enough network. This leads to a highly competitive market, with many players scrambling for the same customers.

Combined, these challenges indicate that to overcome the “chicken and egg” problem agricultural marketplaces must obtain enough capital to go a longer period of time without breaking even (let alone reaching profitability). Though agricultural marketplaces have received noteworthy support from donors in recent years, it has tended to be through one-off seed grants to incentivize innovation and piloting. Follow-on commercial capital tends to be scarce and not especially patient, leading many Platforms to run out of cash before they can bring enough users on board to trigger network effects and reach a critical mass.
So what strategies can agricultural marketplaces use to gain critical mass? While it’s still early to define proven strategies in agriculture, the broader business literature and experience in other sectors point to three potential approaches: 1) build off an existing user base to evolve into a Platform; 2) attract one type of user to the Platform first (and only then target the other); and 3) attract multiple user types at the same time.

The first strategy relies on building or leveraging an existing relationship between a (future) Platform operator and its users, usually through a current pipeline business. Having already aggregated and organized these users, the pipeline business can evolve its role into one of facilitating transactions (while in some cases continuing to run the parallel pipeline business).

The second strategy involves identifying a key set of initial users that can eventually be leveraged to attract a second type of user. This requires thinking about what types of incentives can be used to convince the initial set of users to sign on. The final, and most difficult, strategy involves pursuing the chicken and the egg at the same time. This strategy is challenging in any sector, and even more so within the agricultural sector. However, in limited cases, we have seen it succeed—either in niche markets where interactions are already taking place inefficiently or through the Platform operator guaranteeing both supply and demand by contracting with both sides of the interaction. Since this approach is most complex, costly, and risky, most current agriculture marketplaces pursue one of the first two approaches.
Figure 14: Approaches to solving Platforms’ “chicken and egg” problem and their application in agriculture

<table>
<thead>
<tr>
<th>APPROACH</th>
<th>KEY CONSIDERATIONS</th>
<th>PREVALENCE AND EXAMPLES</th>
</tr>
</thead>
</table>
| **Leverage an existing user base** | From an agricultural pipeline business  
| | • An existing pipeline business with a track record in agriculture leverages its sector expertise, (technological, physical and/or human) infrastructure and market positioning to expand into agricultural-related Platform functions  
| | • Access to a stable (often large) customer base of farmers / agribusinesses attracts another group of users  
| | • Often continues its pipeline business alongside its new Platform functions | Mid-high  
| | **TRRINGO**  
| | Equipment rental marketplace set up by tractor manufacturer (Mahindra & Mahindra) leveraging its network of tractor owners | |
| | From an adjacent pipeline or Platform business  
| | • An existing organization, operating in another sector but with a large number of farmers within its customer base, leverages its customer relationships, brand, trust and field infrastructure to expand into facilitating agricultural transactions  
| | • Tend to be highly digital players with strong tech capabilities e.g., mobile network operators, ag-agnostic product marketplaces  
| | • Quick access to otherwise disaggregated farmers attracts buyers, agribusinesses and service providers | Low  
| | **EcoFarmer**  
| | Integrated product and service marketplace set up by Econet, leveraging its existing mobile network and customer relationships | |
| **Build a new user base in either the demand or supply side first** | By attracting businesses who bring their own farmer customer base  
| | • Platform targets first agricultural businesses with an existing customer base of farmers that would also join the Platform as producers or consumers  
| | • Typically involves providing services with highly valuable additional services, including B2B digital solutions, to drive sign-ups and keep users engaged | Low  
| | **Hello Tractor**  
| | Equipment rental marketplace using its fleet management software to attract tractor fleet owners with an existing network for farmers | |
| | By attracting one set of users who will attract another set users  
| | • Platform targets first one set of users, either farmers or businesses, whose interactions would be particularly valuable for another set of would-be Platform users, either as consumers or suppliers  
| | • To encourage them joining the Platform might subsidize their participation (e.g. through discount codes) or even assume part of the transaction risk by contracting directly with farmers or businesses | High  
| | **IzyShop**  
| | Produce marketplace contracting farmers to lock in sufficient supply of produce to attract buyers | |
| **Build a new user base in both the demand and supply side simultaneously** | By attracting a niche set of users already interacting with each other  
| | • Typically start by engaging a small number of farmers and agribusinesses in a very specific geographic location or value chain and who are already transacting with each other  
| | • The crop and / or geographical focus minimizes the dispersion of network effects, particularly if no other Platform is currently active in that segment  
| | • Often depends on leveraging existing (informal) channels that buyers and sellers are already using to interact with one another, such as social networks | Low  
| | **Mituga Trade**  
| | Specialized livestock trading marketplace that simultaneously onboarded local sellers and buyers to organize and structure transactions that were already taking place in an informal manner | |
| | By attracting a broad mass of multiple types of users  
| | • Involves traditional ‘push-driven’ marketing to create a buzz and attract both producers and consumers at the same time  
| | • Highly risky since targeting the demand and supply side simultaneously is particularly expensive and the Platform may run out of funding before it can reach a critical mass on either side  
| | • Outside of agriculture the approach tends to be used by Platforms where there is a single type of user that acts as both the consumer and producer of the interaction e.g. social networks or communication Platforms | Low  
| | **TruTrade**  
| | Produce marketplace targeting both producers and buyers through formally contracting with farmers to buy their produce and selling this to contracted export buyers | |

Source: ISF Advisors and RAF Learning Lab analysis
**Sustaining scale**

Often, what’s even harder than reaching critical mass is sustaining that scale over the longer term. Globally, product and service marketplaces are able to defend their scale when they successfully maintain strong positive network effects, manage the risk of multihoming (i.e., the practice of users employing more than one agricultural marketplace for the same use case), and control the risk of users bypassing the Platform.

The size and strength of positive network effects are Platforms’ greatest protection against competition. A new operator can build or replicate tech infrastructure, but it is much harder to replicate a large-enough network of both farmers and agribusinesses. For agricultural product and service marketplaces, maintaining strong network effects is often particularly hard since these tend to be highly local. Consider a rental asset marketplace such as TroTro—new tractor operators signing up in northern Ghana add little value to farmers looking for a tractor in south Ghana. This fragmentation into a range of distinct local networks makes the operator more vulnerable to competition. When the network is one and large, entering a market becomes more costly since the operator would need to build awareness and on board users at a global scale to reach a critical mass. When the network is split into multiple local clusters, barriers to entry into a specific local market are lower, attracting new players who will try to compete for the same customers often through a differentiated value proposition e.g., in the case of rental market asset place, new competitors may try to undercut existing players through lower fees per tractor service.

In addition, while the localized nature of agriculture means users will most likely only engage with marketplaces that are active in their specific geographic location, the low or no cost of joining a competing marketplace makes operators highly vulnerable to multihoming. When multihoming becomes prevalent, it can quickly trigger a vicious cycle where, as user engagement decreases, the value of the marketplace declines and more users follow suit. One way to create strong local network effects is to focus on a particular socioeconomic segment and deliver a superior customer experience to them—for example, a produce marketplace focused exclusively on organic produce. Platforms can also build unique features that are hard to replicate from scratch, such as a critical mass of user ratings and data-driven recommendations that consistently bring users back (which, in turn, increases the value of the marketplace).

Since most agricultural product and service exchanges happen in person and often depend on close community links, the risk of bypassing Platforms altogether is high. Once a buyer of produce finds a good match, there may be little incentive to go back to the marketplace for future transactions, especially if there’s a transaction fee and the key friction was finding producers in the first place. Rather than applying measures to prevent users from connecting directly (e.g., using artificial intelligence to block users from sharing their mobile numbers), operators must find ways of enhancing the value proposition so that users extract more value transacting through the marketplace vs. directly. For example, operators can assure some minimum quality standards for inputs or produce sold through the Platform or can enable access to additional services (e.g., finance or advisory services, available only if you complete the transaction through the Platform). If the risk of bypassing is too high, the marketplace might consider shifting its revenue model to charge for lead generation or advertising, thereby capturing value before the transaction is completed.
While it’s still too early to define what works and what doesn’t in building a successful agricultural marketplace, the business literature offers lessons from other sectors on why Platforms typically fail to achieve and sustain scale. As the market evolves, these lessons can serve as valuable references. Some of the most relevant to agriculture include:

- **Entering the market too late**, once strong network effects have been developed by one player. In this scenario, the presence of a dominant Platform may limit the ability of other players to emerge and succeed.

- **Prematurely dismissing competitors and their advantages.** In agriculture this may be particularly true for existing players, which tend to overestimate their capabilities (e.g., a brand, physical infrastructure, or funding) and underestimate the power of more agile teams, a superior customer experience, and an existing network of users.

- **Expanding into new geographies or products/services** without understanding them well, and thereby repeatedly incurring capital-intensive start-up costs. This might be particularly relevant for agricultural marketplaces, given the localized and physical nature of agricultural transactions. It can also explain why relatively fewer Platforms have been set up by non-agriculture players, as the specifics of the smallholder agriculture sector are often quite different from the adjacent industries from which these players come.

- **Mispricing one side of the market and/or failing to develop trust**, which discourages users from joining the marketplace and constrains network effects. Lack of trust continues to be one of the main barriers for the adoption of digital solutions by smallholder farmers, particularly by certain segments (e.g., women, who prefer to transact with local farmers, agents, or businesses).

- **Misjudging the balance between in-house vs. outsourced business functions.** Facilitating interactions between farmers and agribusinesses tends to involve a series of additional services. Figuring out which ones should be outsourced to lower costs and/or increase customer outreach is particularly important for agriculture, where cost may make the path to sustainability especially challenging.

- **Having to adapt to a constantly changing regulatory environment.** As agricultural Platforms become more powerful, increased regulation—around data management/privacy, digital payments, and know your customer (KYC) requirements—will emerge, forcing operators to adapt their business models accordingly. The rise of the mobile money and mobile wallets industry in sub-Saharan Africa offers important lessons in this regard. The operational complexity and funding implications of continuously having to adapt their operations to changing regulatory requirements meant many operators were simply left behind. Given the unique dynamics of Platforms, and their potential implications for market dynamics and outcomes (discussed in more detail in Section 5), the likelihood of new and evolving regulations is high.

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Based on Cusumano, Michael A.; Gaware, Annabelle; Yoffie, David B.: *The Business of Platforms*. Harper Business
As with many other services, women face unique barriers to accessing and engaging with Digital Platforms. Women tend to have lower access to mobile phones, higher levels of digital illiteracy and distrust for new technologies. According to GSMA, women in low-income countries are 8% less likely than men to own a basic mobile phone. More importantly, they are 20% less likely to use mobile Internet services than men—meaning their access to an essential component of most Digital Platforms is limited. The gap is even more pronounced in sub-Saharan Africa and South Asia, where women are 37% and 51% less likely, respectively, to use mobile Internet services. A similar trend can be seen in mobile money usage. While there are important regional variations, women are overall 33% less likely than men to have a mobile money account, constraining their ability to transact through Digital Platforms. In addition, women tend to face important mobility barriers due to caregiving responsibilities and social norms.

For Platform operators, these barriers often make targeting and serving women customers an expensive and time-consuming endeavor. It requires heavy investments in targeted customer acquisition and engagement, often through trusted agents or lead farmers who can drive product awareness. Operators may also have to invest in infrastructure and logistics services to make up for women’s mobility constraints. With many Platforms tight on cash—not to mention focused on fast growth to trigger network effects—these investments are rarely a priority. Instead, marketplace operators may focus on the easiest-to-reach customers (often male farmers), further perpetuating gender gaps in digital access and usage, productivity, and income.

In the process, however, Platforms may be missing out on a wider market opportunity. Early evidence from DigiFarm—an integrated product and service marketplace with more than 1.4 million registered users in Kenya—suggests that, when service delivery is adapted to fit their needs, women are as or even more likely than men to register for, and actively use, DigiFarm. When the Platform launched in 2017, customer acquisition focused primarily on registering farmers on market days in “market towns”. This allowed DigiFarm to scale quickly but with a predominantly male customer base. Recognizing the challenges women face in digital access, in 2019 DigiFarm partnered with a women’s cooperative, whose agents supported women farmers in signing up for and engaging with the Platform.

Figure 16: DigiFarm registrations and service usage by gender

Source: Mercy Corps Agriflin Accelerate (2021). Digital Agricultural Platforms Blueprint Series; Busara Data Analytics for DigiFarm (2020); ISF Advisors and RAF Learning Lab analysis
Platforms like DigiFarm are particularly well-suited to address women’s barriers to market and service access, in the process enhancing their livelihoods. This is especially true if they can facilitate offtake, enable e-learning, and leverage data for digital credit scoring and access to inputs. DigiFarm’s female customers report increased productivity, access to better quality inputs and advisory services, and increased income. For many women, who previously did not have access to markets, DigiFarm has made it possible to add a new income stream to the household. Women also report time savings—perhaps because they don’t have to spend so much time searching for service providers or managing transactions, or because their increased income allows them to hire extra help—freeing up time for other activities. This, combined with additional sources of income and control over their finances, have enabled DigiFarm’s women customers to boost their household decision-making power, self-esteem, and confidence.

Relative to men, women seem to be attracted by certain aspects of DigiFarm’s value proposition, including non-cash form of inputs on credit, access to higher quality inputs, and guaranteed offtake. Women are also eager to use market access services, as it assures ownership over additional income for their families—in fact, they are more likely than men to sell produce through DigiFarm vs. other channels. Women also place more value on the presence of field agents to support in product registration and delivery of advisory services.

This evidence about women’s preferences and usage of DigiFarm offers lessons on how Platform operators can more intentionally target women customers. While these targeted acquisition efforts may require more upfront investment, the DigiFarm example demonstrates the potential of women to become attractive customer segments with high lifetime customer value. Particularly since Platforms tend to be able to capture more value from offtake-related transactions (services that women may be more likely to use than men) than from other lower margin services such as advisory, or inputs.

**Putting it all together: product and service marketplace profiles**

The marketplace taxonomy presented above helps us get a deeper understanding of where, why, and how different types of marketplaces emerge as well as the implications for their business model and the markets in which they operate. Figure 15 lays out a full profile for agricultural supplies marketplaces, with specific insights around the interaction facilitated, provider types, business models, and market level. Additional profiles for the other marketplace types can be found in the Annex.
Figure 15: Ag supplies marketplace profile

1. Ag Supplies Marketplace
Ag supplies marketplaces facilitate the trade of farm supplies and input, linking farmers to agro-dealers in order to purchase seeds, fertilizers, pesticides, and tools.

<table>
<thead>
<tr>
<th>Models Profiled:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Africa: 6</td>
</tr>
<tr>
<td>Asia: 3</td>
</tr>
<tr>
<td>Latin America: 2</td>
</tr>
</tbody>
</table>

**Interaction and services overview**

- **Input supply & pre-production**
- **Production**
- **Post harvest & transport**
- **Trading & marketing**
- **Wholesale**
- **Retail & consumption**

**Value proposition:** For farmers, lower costs and greater access to higher quality agricultural supplies; for ag input suppliers, better access to fragmented demand.

**Core service offering:** Includes digital listings for agricultural supplies, payment processing, and a fulfillment management system (including complaints management). Some ag supplies marketplaces, such as BigHaat, hold inventory and manage delivery (the “Amazon model”); others, such as Agrofy, purely facilitate the connection with fulfillment managed by the ag supplies provider (the “eBay model”).

**Other value-added services:** Additional services seen in the market range from complementary advisory services (e.g., BigHaat) and insurance (e.g., Agrostar) to marketing support. In profiled marketplaces, typically no credit is yet being offered, although Agrostar does also connect farmers to credit providers.

**Level of curation:** These models are typically open and uncurated, with basic filtering of available listings by geography and type of product.

**Access:** Models profiled primarily provide web-based access to the marketplaces. Interestingly, the three largest such models—India-based AgroStar, BigHaat, and FarmGuru—provide low-cost SMS and phone-based ordering options, including allowing farmers to be called back (“missed-call ordering”). Among these three, AgroStar also has a smartphone app, which farmers can use to order products and access additional information.

**Platform providers and business models**

<table>
<thead>
<tr>
<th>Tech company</th>
<th>Mobile network operator</th>
<th>Agri-business or ag goods/service provider</th>
<th>Government</th>
<th>Other non-ag</th>
<th>Other</th>
</tr>
</thead>
<tbody>
<tr>
<td>(5)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</table>

**Market fit:** Works best in markets with multiple layers of intermediation: low quality or low information on the quality of ag supplies; and with existing distribution infrastructure to easily manage fulfillment. In many markets, solving only frictions related to the availability of ag supplies is not enough; market access (for agricultural produce) and access to additional farm services (including finance) is also needed. In such markets, Platforms with a broader focus (e.g., integrated farm services marketplaces, combined ag supplies and produce marketplaces) are more prevalent.

**Providers:** Profit-first tech companies have naturally emerged as the primary operators of ag supplies marketplaces, likely based on their neutral market positioning, technology capabilities, and relatively functional knowledge required to operate such Platforms.

**Revenue model:** Most Platforms generate revenues directly through the Platform, mainly transaction fees. As such, Platforms’ ability to be sustainable depends on achieving a minimum viable scale and sufficient economics to allow farmers to purchase ag supplies, rather than receive them free or subsidized.

**Early success:** In India, tech start-ups such as BigHaat and AgroStar have raised large amounts of commercial capital, showing the potential commercial viability of such models. This has not yet been the case in Latin America or Africa, where models are mostly small and rely on grant or concessional financing.

**Ag-specific vs. general marketplaces:** Many general e-commerce Platforms (such as Rural Taobao) include agricultural supplies as a product category. The decision to focus exclusively on agriculture can enable stronger brand alignment but also create further challenges in achieving required scale.

**Examples**

- **AgroStar**: A one-stop solution where farmers can access personalized recommendations to help them select the right inputs. They can also purchase a variety of quality products like seeds, crop protection, nutrition, and farm implements.

- **BigHaat.com**: An online seeds company that works with several seed suppliers across India to provide transparent, competitive, and quality services to seed buyers. It ensures online listing of products and connects buyers with suppliers.

Source: ISF Advisors and RAF Learning Lab analysis
Global experience makes it clear that Platforms have the potential to create, reshape, and democratize markets, as well as create significant value for a wide range of users. While it is still early days, the ability of Platforms to similarly transform smallholder agricultural markets—which are complex, volatile, and highly fragmented—is promising. These markets are characterized by a set of recurring challenges, many of them systemic in nature. Resolving these challenges will therefore require a systemic solution that reshapes the actors, relationships, norms, and incentives that drive market dynamics and outcomes.

In recent years, there has been a movement to design food systems to be more inclusive, sustainable, and commercially viable. While still emerging, this agenda could reimagine how agricultural markets operate. Platforms offer one possible approach for reorganizing these markets—we know from global experience that they can be efficient intermediaries, aggregating disorganized markets and introducing market-mediating mechanisms that scale. Platforms also have the potential to intermediate within and between all layers of the agricultural market.

Figure 17: Platforms within food systems

Within this new movement towards agricultural transformation, Platforms present an interesting new approach to organising markets

Platforms create ecosystems to facilitate the open exchange of value through:

i. Curating which actors can participate as Platform users

ii. Building and facilitating valuable connections between users

iii. Designing the norms and incentives that reinforce positive Platform interactions and behaviour

Source: 1) IDH Farmfit, Private Sector Development Strategies: Leveraging the Private Sector for Market Transformation in Smallholder Agriculture, forthcoming
In this section, we explore the extent to which smallholder agriculture Platforms can impact markets on a systemic level, drawing on insights from other sectors. We consider both the positive and negative potential impacts, and reflect on implications for donors and policymakers.

**Considering potential positive impacts**

Platforms, by their very nature, change how markets operate. From global experience, we know that they can play an active role in providing governance to the ecosystems they create and impact. This power is often positive; Platforms can not only reshape or redistribute the pie, they can increase the overall size of the pie by enabling interactions that otherwise would not happen or by increasing the value of interactions that already were happening.

Good Platform governance can lead to a number of positive outcomes. For instance, a well-designed market makes it easier or more likely for high-quality interactions to occur. Platforms can provide better data for decision making by their users through improved transparency. They can also actively curate user participation in the Platform—for instance, by selecting users with good creditworthiness or high-quality goods and services. Some Platforms actively support matchmaking between users, making it easier for them to find one another and thus reducing search costs. Also, through their ability to create a set of incentives that govern user behavior—rewarding desired behavior and discouraging negative behavior—Platforms can reduce undesired activities and outcomes. For all of these reasons, well-designed Platforms have the potential to reshape markets in ways that move toward the emerging vision of a food system that is more inclusive, sustainable, and commercially viable.

**Figure 18: Possible food system outcomes from Platforms**

<table>
<thead>
<tr>
<th>Market transformation outcomes</th>
<th>Potential Platform contributions</th>
</tr>
</thead>
<tbody>
<tr>
<td>INCLUSIVE</td>
<td>Broader access to inputs, equipment and services that support smallholder farmer production</td>
</tr>
<tr>
<td>SUSTAINABLE</td>
<td>Broader access to inputs and advisory services that enhance climate smart agriculture and increase sustainability</td>
</tr>
<tr>
<td>COMMERCIALLY VIABLE</td>
<td>More efficient connections between input providers and smallholder farmers can lead to lower prices and great access to productivity-enhancing inputs, supporting the profitability of smallholder farmers</td>
</tr>
</tbody>
</table>

- Broader access to input markets through direct connections between smallholder farmers and buyers (both wholesale and retail)
- Broader access to financial services to enable smallholder farmers to increase farm investments and manage risk
- Improving access to information and data for farmers, allowing them to make more informed decisions
- Greater transparency of rural transactions and traceability of produce support decision making around natural resource management
- More efficient connections between smallholder farmers and buyers can lead to higher prices for produce and lower transaction costs, improving the profitability of smallholder farmers
- Reduced operating costs (e.g., for customer acquisition, logistics and fulfillment) for service providers increases business model viability

Source: Market transformation outcome categories based on IDH Farmfit, Private Sector Development Strategies: Leveraging the Private Sector for Market Transformation in Smallholder Agriculture, forthcoming
Considering potential negative impacts

While Platforms have the potential to positively transform food systems, they can also generate potential negative impacts. Outside of agriculture, in sectors where Platforms have existed for much longer, the dominant narrative in the business literature has shifted from overwhelmingly positive enthusiasm for the potential and value of Platforms to increased trepidation, if not outright hostility, toward Platforms’ power and dominance.

In considering the experiences of other sectors, it’s important to understand that successful Platforms inevitably acquire power. As Platforms scale, the ways in which that market-shaping power translates into outcomes for different stakeholders can be both positive and negative. This creates a need for good governance, either by the Platform operator itself or through enforcement by regulatory bodies. Good governance is essential to any well-functioning system—whether countries, multilateral bodies, or Platforms. While markets and market dynamics can generate many positive outcomes, absolutely free markets without rules or regulations cannot be relied upon to produce fair and satisfactory outcomes for everyone. This is particularly important in smallholder agricultural markets, where critical outcomes—such as food security, inclusion of marginalized population segments, and environmental impacts—require good governance to be safeguarded and strengthened.

It’s clear that the accumulation of power by Platforms can, in some cases, lead Platform operators’ own interests to diverge from those of Platform users and from the broader market. The challenge for Platforms is to compete aggressively while staying within the bounds of what most societies consider not just legal, but fair and ethical.

In agricultural markets, there are six potential negative impacts that could result from Platform models:

1. **EXCESSIVE MARKET DOMINANCE:** Excessively dominant Platforms can create their own forms of market distortions and inefficiencies.

   Across numerous industries, Platforms have repeatedly re-intermediated markets, introducing themselves as new kinds of middlemen rather than simply eliminating layers of market participants. In agriculture, the current, relatively high-degree of consolidation of dominant agribusinesses can be replaced with even more dominant Platform businesses, reducing competition. When these Platforms accumulate enough power, this can lead them to a position of being able to extract monopoly or quasi-monopoly rents, as the Platform operator essentially controls access to users and even markets. Such platforms could use exclusionary practices to discourage their users from engaging with competitors or ‘lock in’ users with anti-competitive contracts. Strong enough Platforms might even use their scale to compete in adjacent markets, entering and competing in these markets based not on their competitive advantages, but on their ability to cross-subsidize their activities.

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2. **PLATFORM-USER COMPETITION:** Platform operator competes with users on its own Platform.

In some industries, Platforms have, over time, competed with users by offering their own pipeline goods or services. Regulators have often viewed this as negative market distortion, as the Platform operator can unfairly compete through access to more and better data (including data on all users of the Platform) and by giving their own products and services more visibility compared to those of other Platform users. An example is Amazon, which has been criticized for using its Platform power to rapidly acquire or displace companies that are dominant in different product categories.

3. **DISPLACEMENT:** Supplanting of vulnerable MSMEs.

Platforms can create a channel for relatively smaller businesses to access markets, by using the infrastructure of a Platform to identify and reach customers—and for those customers to find them. However, certain MSMEs may not be able to access Platforms (e.g., due to lack of digital connectivity) or their scale of operations may no longer be viable when Platforms make it possible for more distant actors to compete in their highly localized markets (e.g., ag supplies marketplaces supplanting local small agriculture supplies sellers). In agriculture, the proportion of MSMEs, such as small traders and retailers serving highly localized markets, is relatively high. The emergence and growth of agriculture Platforms must therefore be balanced against impacts on businesses active at the micro level.

4. **DATA AND SECURITY:** Less control and ownership over data and information.

Aggregating, analyzing, and utilizing vast amounts of data on users and interactions is a core part of Platforms’ service offerings and value proposition. However, in many cases, the vast amount of data that is collected—as well as the lack of transparency around what is collected and how it is used—raises concerns around data ownership and privacy. This is especially true when Platform services are provided free or heavily discounted in return for the monetization of user data. In the smallholder agriculture sector, data ownership is an important topic. While more and more data is generated on farmers, their households, and their farms, there are few regulations on data protection and limited farmer awareness of what data is being generated, by whom, or how it’s used. The vast volumes of data that Platforms generate can exacerbate this already troubling situation.
5. **WORKFORCE PROTECTIONS AND POWER DYNAMICS:** Reduced security and benefits for gig workers compared to traditional employment.

Many non-agriculture Platforms are based around the concept of the gig economy. Platform-based gig workers (such as taxi drivers, food delivery contractors, and cleaners) typically operate as contractors, enjoying no or very limited legal protections when compared to employees in traditional pipeline businesses. In agriculture, the jury is still out on the scale of this risk: rural youth often face a significant lack of (stable and formal) employment opportunities and enjoy limited workforce protections when they are employed. Platforms can provide a structure to current informal employment practices and increase the efficiency with which rural youth can find job opportunities. However, as Platforms continue to grow—and the markets in which these Platforms operate become more mature—a relative lack of protections for gig workers may become a challenge.²¹

6. **VULNERABLE POPULATION SUB-SEGMENTS:** While likely improving inclusion for some vulnerable population sub-segments, Platforms may not be able to reach all vulnerable segments and may thereby exacerbate the digital gap.

Due to lower mobile and/or digital connectivity (e.g., such as that faced by women) or more difficult economics for certain segments of farmers (e.g., remote subsistence farmers), the complexity and difficulty of reaching these farmers may be too high for Platforms, who may not be able to find a way of including these farmers in a commercially viable way. Without alternatives for these population sub-segments, the gap between these farmers and farmers that are included on Platforms may increase, improving rural livelihoods for some while leaving others behind. Platforms—especially those with a profit motive—will often have little direct incentive to resolve these challenges, and therefore action by policymakers and development actors is likely needed, for instance by creating more employment opportunities through broader rural economic development strategies. Efforts and capital invested into Platforms should not come at the expense of improving livelihoods of populations unlikely to benefit from a ‘Platform revolution’ in agriculture. By contributing to more vibrant agricultural markets, Platforms can indirectly contribute to creating more employment opportunities for vulnerable population segments outside of farming and even outside of agriculture in rural areas.

These potential negative impacts should be carefully weighed against the positive outcomes that can be achieved for users. Additionally, we must recognize that an over-reliance on Platforms as the game-changer in smallholder agricultural markets could lead to a mix of radically different trajectories for different types of rural households that will shape what rural economies might look like. On the one hand a highly digitized, highly productive and fast-growing rural economy driven by those that are able to engage with Platforms, and digital services more broadly speaking; in parallel, a lagging, low productivity, traditional economy driven by those that cannot benefit equally from Platforms, with negative implications for inclusion. Now is the time for policymakers and donors to ask what the rural economy should look like in the short-, medium-, and long-term—and what role Platforms can play in this transformation. To fully capitalize on the promise of Platforms, donors and policymakers must reconcile their potential to counter market frictions and shape interactions for the better with their unintended—but very real—downside risk of exacerbating existing power imbalances.
The role of regulators

Regulators should lead the way in considering whether the market inefficiencies that Platforms overcome are large enough; whether there are instances or potential for the abuse of dominant power; and whether the Platform has internal governance systems in place to reduce negative externalities (including to govern its own behavior). In cases where negative externalities are occurring, regulators must determine whether and what kind of regulatory response is required to mitigate them. As regulators develop frameworks to govern the operation of Platforms, donors should also weigh these risks in making investment decisions.

A number of national and international institutions (e.g., the European Commission, OECD, French Conseil National du Numérique, German Competition Authority, UK House of Lords, and others) have engaged in vigorous debates over whether Platforms ought to be governed by a new line of bespoke regulations. These debates are likely to continue for several years, although some countries have already changed their laws. The French Parliament, for example, adopted a law on “platform fairness” (loyauté des plateformes) in October 2016. The broad direction for Platform regulation in Europe can probably be predicted in the 2016 statement by the European Commission, which offered four fundamental principles to foster a “trusting, lawful, and innovation-driven ecosystem around online platforms in the EU”: (1) a level playing field for comparable digital services, (2) ensuring that online Platforms behave responsibly to protect core values, (3) fostering trust, transparency, and ensuring fairness, and (4) keeping markets open and nondiscriminatory to foster a data-driven economy.

In this report, we have explored some of the reasons why Platforms have been slower to emerge in agricultural markets than in other sectors. This includes historical challenges to rural connectivity, the localized nature of agricultural production, and the relative underdevelopment of the enabling environment and infrastructure, among other factors. However, increasing digital connectivity, the advancement of technology, and the growing importance of food systems have led to the emergence of a number of early agricultural Platforms.

In general, these Platforms have taken two forms. On the one hand, we see mature, multi-sector communications, social media, content, investment, and payment Platforms being utilized by different actors in agricultural value chains, increasing connectivity and efficiency across a number of interactions. On the other hand, there is the emergence of more than 70 agriculture-specific product and service marketplaces that span eight distinct models—which have the potential to generate significant effects on the way agricultural markets operate. In some cases, models such as farm services rental marketplaces are creating access to new services entirely. In other cases, models such as ag supplies and trading marketplaces are dis-intermediating and re-intermediating existing access to goods, services and markets.

As these models continue to evolve, we believe that there should be a next phase of Platform growth marked by:

1. **A move from general hype to deep interest in particular segments and models:**
   As outlined in this report, there are a number of key distinctions around Platforms. At the first level, we distinguish between Digital Platforms, digital solutions, and coordination initiatives; at the second level, between the different types of Digital Transaction and Innovation Platforms; and at the third level, between different product and service marketplaces. These distinctions reflect very different business models, users, and market-transforming potential. As a sector, we must now move beyond a general interest in Platforms as a concept to a deeper understanding of specific segments and models. This understanding should be used to shape agendas, funding, and impact theses that can help realize the potential of different Platforms over time. A key part of this deepening understanding will also be more disciplined distinction between digital solutions and Digital Platforms;

2. **Any further application of subsidy to be linked to specific theses:**
   In order to realize the potential of Platforms in smallholder-related agricultural markets, more subsidy will be needed to reduce the costs and risks of experimentation. This report creates an opportunity to link any further subsidy to more specific business model and impact theses. As donors consider supporting Platform operators, we believe more specific questions—about their type of model, key design choices, specific tipping
One of the biggest knowledge gaps in the sector is understanding of what works and does not work in building and scaling business models that involve smallholder farmers—particularly models that are inclusive, sustainable, and commercially viable. To a large extent, this is natural; the sector is still in its infancy, with providers experimenting and learning from business model innovations. But as the sector prepares for the next phase of growth, we must wield a deeper and more systematic understanding of Platform business models.

Together with IDH Farmfit, we have taken the first step in this direction. Over the coming months, we will extend IDH Farmfit’s service delivery model approach and methodology—which has been used to assess the sustainability and commercial viability of more than 90 agricultural service providers to date—to assess agricultural Platforms. The methodology will build off key frameworks and concepts introduced in this report, enabling a systematic and data-driven assessment of agricultural Platform service delivery models.

Providers engaging with IDH Farmfit for a service delivery model assessment will be able to improve their performance by getting a better grasp on their business case and funding needs, the risks and opportunities under different scenarios, and the value created for different Platform users. As IDH Farmfit engages with an increasing number of Platforms and aggregates insights, we will generate cross-cutting lessons for providers, funders, and practitioners. These stakeholders will be able to understand efficient program design and resource allocation, while also adopting a common language and methodology that contributes to the ongoing systematic assessment of Platform business models.

3. **A more systemic view of how Platforms shape markets and the critical role of governance in managing possible downside risks:**

The slower emergence of Digital Platforms in agriculture can be seen as a significant opportunity. With over two decades of learning from other sectors to draw from, and a more nuanced understanding of how Platforms can transform markets with positive and negative effects for different users, we are in a position to more fully consider the longer term. With the typical impact horizon of many donors, investors, governments, and providers being two to four years, we encourage the sector to learn from the experience of developed markets, where complex negative impacts and governance issues surrounding Platforms are now being rigorously debated.
ANNEX: PROFILES OF THE TYPES OF AGRICULTURAL PRODUCT AND SERVICE MARKETPLACES

Profiles are not included for transport and logistics marketplaces and insurance marketplaces. The former are not included as we identified only sector-agnostic logistics providers catering to agriculture sector clients alongside clients in other sectors. As there are many more such sector-agnostic transport and logistics marketplaces globally that we did not profile, we did not create an overview of this type of platform. We identified only one agriculture-specific insurance marketplace, too small a sample size to create a profile reflecting an entire category.
1. Ag Supplies Marketplace

Ag supplies marketplaces facilitate the trade of farm supplies and input, linking farmers to agro-dealers in order to purchase seeds, fertilizers, pesticides, and tools.

Models Profiled: 6
- Africa: 1
- Asia: 3
- Latin America: 2

Interaction and services overview

- **Value proposition:** For farmers, lower costs and greater access to higher quality agricultural supplies; for ag input suppliers, better access to fragmented demand.
- **Core service offering:** Includes digital listings for agricultural supplies, payment processing, and a fulfillment management system (including complaints management). Some ag supplies marketplaces, such as BigHaat, hold inventory and manage delivery (the "Amazon model"); others, such as Agrofy, purely facilitate the connection with fulfillment managed by the ag supplies provider (the "eBay model").
- **Other value-added services:** Additional services seen in the market range from complementary advisory services (e.g., BigHaat) and insurance (e.g., Agrostar) to marketing support. In profiled marketplaces, typically no credit is yet being offered, although BigHaat does also connect farmers to credit providers.
- **Level of curation:** These models are typically open and uncurated, with basic filtering of available listings by geography and type of product.
- **Access:** Models profiled primarily provide web-based access to the marketplace. Interestingly, the three largest such models—India-based AgroStar, BigHaat, and FarmGuru—provide low-cost SMS and phone-based ordering options, including allowing farmers to be called back ("missed-call ordering"). Among these three, AgroStar also has a smartphone app, which farmers can use to order products and access additional information.

Platform providers and business models

- **Market fit:** Works best in markets with multiple layers of intermediation; low quality or low information on the quality of ag supplies; and with existing distribution infrastructure to easily manage fulfillment. In many markets, solving only frictions related to the availability of ag supplies is not enough; market access (for agricultural produce) and access to additional farm services (including finance) is also needed. In such markets, Platforms with a broader focus (e.g., integrated farm services marketplaces, combined ag supplies and produce marketplaces) are more prevalent.
- **Providers:** Profit-first tech companies have naturally emerged as the primary operators of ag supplies marketplaces, likely based on their neutral market positioning, technology capabilities, and relatively functional knowledge required to operate such Platforms.
- **Revenue model:** Most Platforms generate revenues directly through the Platform, mainly transaction fees. As such, Platforms’ ability to be sustainable depends on achieving a minimum viable scale and sufficient economics to allow farmers to purchase ag supplies, rather than receive them free or subsidized.
- **Early success:** In India, tech start-ups such as BigHaat and AgroStar have raised large amounts of commercial capital, showing the potential commercial viability of such models. This has not yet been the case in Latin America or Africa, where models are mostly small and rely on grant or concessional financing.
- **Ag-specific vs. general marketplaces:** Many general e-commerce Platforms (such as Rural Taobao) include agricultural supplies as a product category. The decision to focus exclusively on agriculture can enable stronger brand alignment but also create further challenges in achieving required scale.

Examples

- **AgroStar**
  - AgroStar is a one-stop solution where farmers can access personalized recommendations to help them select the right inputs. They can also purchase a variety of quality products like seeds, crop protection, nutrition, and farm implements.

- **BigHaat.com**
  - BigHaat is an online seeds company that works with several seed suppliers across India to provide transparent, competitive, and quality services to seed buyers. It ensures online listing of products and connects buyers with suppliers.

Source: ISF Advisors and RAF Learning Lab analysis
2. Produce Marketplace

Produce marketplaces link smallholder farmers to buyers for their produce, typically through buyer-to-seller transactions. Buyers are often small- or medium-sized, including consumers.

<table>
<thead>
<tr>
<th>Models Profiled: 24</th>
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<tbody>
<tr>
<td>Africa: 9*</td>
</tr>
<tr>
<td>Asia: 9*</td>
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<tr>
<td>Latin America: 7</td>
</tr>
</tbody>
</table>

## Interaction and services overview

![Flowchart showing value proposition and services]

**Value proposition:** For buyers, easier, traceable, and better priced agriculture produce; for farmers, better market access (with greater sales volumes, more buyers, and better prices). A number of these Platforms focus on perishable crops, for which timely access to market is critical; others appear to be crop-agnostic.

**Core service offering:** Includes digital listings, payment processing, and a fulfillment management system (e.g., Agro Market Day, I Got Crops, ComproAgro). Some providers also use field agents and distribution centers to recruit farmers to the Platform, support usage, and facilitate fulfillment of orders (e.g., IzyShop, AidOno). About half of the profiled Platforms actively manage order fulfillment, either with in-house or partner resources. Interestingly, the proportion of Platforms that provide in-house logistics is about the same (50%) in relatively well-developed markets (India) and in less mature markets (sub-Saharan Africa), suggesting that this service may be increased to increase the value proposition or as a necessary requirement to ensure participation.

**Other value-added services:** Additional services seen in the market include more sophisticated payment processing (e.g., Zowase!), financing (e.g., TaniHub), or advanced communication functionality (e.g., KrishiHub).

**Level of curation:** Most allow any farmer and any buyer to use the Platform, though some have minimum requirements for farmers to be able to join (e.g., Selima Wamuci) or recruit farmers based on geography and types of crops (e.g., Farmster).

**Access:** Most models profiled rely on both web- and mobile-based access to the marketplace. A small number of Platforms also use field agents to reach farmers that do not have access to (or lack the ability to access) digital channels.

## Platform providers and business models

<table>
<thead>
<tr>
<th>Tech company (22)</th>
<th>Mobile network operator</th>
<th>Agri-business or ag goods/service provider</th>
<th>Government (2)</th>
<th>Other non-ag</th>
<th>Other</th>
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</table>

**Market fit:** Model can add most value in markets with several layers of intermediation between farmers and markets, developed logistics networks for transaction fulfillment, and information challenges hampering buyers and sellers of agricultural commodities from finding each other. In addition, given the often small transaction sizes, this model also works in markets with fragmentation of buyers.

**Providers:** With the exception of two government-run Platforms (both in Latin America), all produce marketplaces are tech companies. None run concurrent agribusinesses, which implies that successfully running a produce marketplace is best done by neutral players that can be a trusted partner to both farmers and buyers.

**Revenue model:** A large number of Platforms can generate transaction and usage fees, while a number of others are funded/subsidized by governments (e.g., La Finca) or supported by donors.

**Early success:** Among the different models, produce marketplaces have the smallest average scale; over 70% serve fewer than 10,000 farmers and the remainder below 100,000 farmers. While many of these are very early stage, we hypothesize that their low scale reflects the complexity of setting up and scaling a Platform that caters to both a fragmented supply (many smallholders farmers) and a fragmented demand (many small buyers such as consumers and small retailers). Nonetheless, at least a third of such Platforms in Asia (e.g., TaniHub) and Africa (e.g., IzyShop, Farmshine) have raised several rounds of commercial capital, despite their relatively limited scale, illustrating the perceived promise of such types of marketplaces and, perhaps, their ability to generate revenues relatively more easily than Platforms facilitating other types of interactions, such as farm services and ag supplies marketplaces.

### Examples

- **IzyShop (Mozambique):** Offers online grocery shopping which connects smallholder farmers to consumer markets. Buyers (typically consumers) purchase groceries through the Platform, which includes delivery of produce to their homes.

- **TaniHub (India):** Is a marketplace that connects farmers with food, hotel, restaurant, and catering businesses. Through TaniHub, local farmers can sell their crops to individuals, as well as micro, small, and medium enterprises.

*One Platform is active in both Africa and Asia and is therefore double-counted*

Source: ISF Advisors and RAF Learning Lab analysis
3. Combined Ag Supplies and Produce Marketplace

Platform that combines the functions of ag supplies and produce marketplaces, both linking farmers to buyers for their produce, while also facilitating farmer access to a range of agricultural supplies.

Models Profiled: 8
Africa: 4
Asia: 2
Latin America: 2

Interaction and services overview

Value proposition: Typically, models in this category begin as produce marketplaces and expand by adding ag supplies to their core service offering, building on their existing infrastructure and relationships with farmers. For farmers, this increases the value proposition by providing a one-stop shop for inputs and offtake. In many cases, the integrated service offering is specifically designed to be complementary; for example, providing inputs tailored to the types of plant material sold through the Platform and securing offtake for those same crops (e.g., FarmCrowdy).

Core service offering: These models use the same infrastructure to facilitate interactions both from and to the farm, including digital listings for agricultural supplies, facilitation of payment processing, and a fulfillment management system. A number of providers support field agents, warehouses, and transport infrastructure to recruit farmers and support fulfillment.

Other value-added services: Additional services include advisory services (e.g., Waycool, Khetinext), payments processing (e.g., Milouma and Agrocenta), warehouse receipt services (e.g., Ninayo), and product financing (e.g., Croper). In addition, catering for both input and offtake markets for farmers allows these Platforms to generate more comprehensive farmer profiles and use that data to support decision making and business intelligence.

Level of duration: Most allow any farmer and any buyer to use the Platform, though some have minimum requirements for farmers to be able to join or recruit farmers based on geography and types of crops grown.

Access: Most models profiled rely on both web- and mobile-based access to the marketplace. A small number of Platforms also use field agents to reach farmers.

Platform providers and business models

<table>
<thead>
<tr>
<th>Tech company (8)</th>
<th>Mobile network operator</th>
<th>Agri-business or ag goods/service provider</th>
<th>Government</th>
<th>Other non-ag</th>
<th>Other</th>
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Market fit: All models appear to operate in fragmented markets and loose value chains, where organizing both demand and supply (of ag commodities and ag supplies) can yield efficiencies and create value—for example, by cutting out middlemen and facilitating otherwise complicated logistics.

Providers: All eight profiled models are profit-first tech start-ups, able to play a neutral role and intermediate between ag supplies providers and farmers (where trust is an important asset), as well as provide farmers with a neutral intermediary to offtake markets.

Revenue model: At least half of the models have received grant funding and five are generating Platform-related revenues (e.g., transaction fees). Those that do not generate revenues from transaction fees rely on grants and government subsidies (two) or advertising revenues (one).

Early success: On average, these Platforms are larger than individual ag supplies or produce marketplaces, with several models working with 100,000+ farmers in both India and sub-Saharan Africa. As combining two types of marketplaces is complex, a larger scale is needed to make the economics work.

Examples

Waycool (India) facilitates farmers’ access to highly fragmented markets (e.g., hotels, restaurants, retailers) and provides access to a range of ag supplies, including seeds and inputs. Besides Platform functions, it offers a wide range of digital solutions, including advisory services, soil health checks and farm planning and management.

Ninayo (Tanzania) supports farmers with marketing their crops and facilitates farmers’ access to inputs. Besides these core Platform functions—which are free to use for farmers—it offers a number of additional services, both free (e.g., advisory services) and paid (e.g., warehouse receipt services).

Source: ISF Advisors and RAF Learning Lab analysis
4. Trading Marketplace

Digital wholesale marketplace where farm produce is aggregated and sold in bulk, rather than in individual and smaller direct transactions between farmers and (medium and smaller) buyers.

Models Profiled: 9
- Africa: 4
- Asia: 2
- Latin America: 3

Interaction and services overview

- Input supply & pre-production
- Production
- Post harvest & transport
- Trading & marketing
- Wholesale
- Retail & consumption

Value proposition: For buyers, trading marketplaces improve the efficiency of procurement as these no longer need to work through aggregators (e.g., cooperatives, traders) or directly with a large numbers of farmers. In addition, buyers benefit from improved supply security and better traceability. For farmers, trading marketplaces improve access to wholesale markets, with higher sales volumes and prices. The wholesale nature of these Platforms often caters to larger farmers or cooperatives; however, many profiled Platforms also serve smaller farmers. The focus is typically on grains and staples.

Core service offering: Consists of digital listings, payment processing, and a fulfillment management system, including aggregation of produce from farmers. Almost all Platforms profiled were entirely digital, with limited fulfillment assets, such as field staff, trucks, and warehouses.

Other value-added services: Additional services observed in the market include more advanced payment processing (e.g., Mifugotrade), linking of farmers to financial institutions (e.g., Agrilife), and provision of pricing comparisons across time and geographies (e.g., Eco Connect, Graco Direto). Some models also offer advanced market intelligence for buyers, generated from data captured on production and sales volumes (e.g., Agrea Market uses blockchain technology to authenticate contracts).

Level of curation: Profiled Platforms facilitate open participation in a bid/buy marketplace structure with limited curation of users or transactions. We hypothesize that this lack of curation makes such Platforms less suited to crops where quality is paramount or quality of produce from different farmers varies widely.

Access: Most Platforms use mobile-friendly web-based portals. One (Graco Direto) has developed a dedicated mobile app.

Platform providers and business models

| Tech company (7) | Mobile network operator | Agri-business or ag goods/service provider (1) | Government (1) | Other non-ag | Other |

Market fit: Trading marketplaces work best in fragmented (at the farm-level) markets where larger off-takers and traders struggle to access produce efficiently. Though the types of crops traded vary between the different Platforms, most focus on crops used as inputs for processed goods, such as grains, rice, and maize.

Providers: With the exception of AFEX (a Nigerian commodity exchange) and E-NAM (a government-run Platform), all models are tech start-ups.

Revenue model: Very few of these models appear to receive or have received grant funding; instead, they operate commercially, similar to commodity exchanges. All profiled trading marketplaces include transaction and/or membership fees, with some generating additional revenue through advertising (e.g., CBC AgroNegocios) and market intelligence (e.g., Agrilife). Only one Platform is entirely funded from external sources, which is government-run and -funded E-NAM (India).

Early success: These type of Platforms were relatively small, with six out of nine profiled Platforms serving fewer than 100,000 farmers, and only E-NAM serving over one million farmers. We hypothesize that the uptake of purely digital trading marketplaces will remain challenging in markets without established physical infrastructure to enable the exchange.

Examples

Mifugo.trade (Kenya) is an online livestock exchange for livestock producers and buyers. It uses a network of agents, who visit livestock sellers, evaluate animals, and upload relevant information on a sale to the Platform, as well as a range of payment solutions for both buyers and sellers.

CBC AgroNegocios (Brazil) connects buyers and sellers of grains and livestock, and provides macro-agricultural intelligence through a pricing dashboard that compares pricing for products within the Platform with historical and spot prices from international markets and exchanges.

Source: ISF Advisors and RAF Learning Lab analysis
5. Integrated Farm Services Marketplace

Marketplaces facilitating access to a holistic, bundled offer to farmers. Similar to combined ag supplies marketplaces, but enabling access to a broader range of service providers beyond input suppliers.

Models Profiled: 19
- Africa: 6*
- Asia: 10*
- Latin America: 4

Interaction and services overview

- Input supply & pre-production
- Production
- Post harvest & transport
- Trading & marketing
- Wholesale
- Retail & consumption

Value proposition: For farmers, a broader set of complementary ag supplies and services can help increase farm yields and income. For service providers (e.g., input supplier, financial service providers), complementary services and facilitated access to farmers can simultaneously increase demand while decreasing the cost and risks associated with service provision.

Core service offering: These Platforms facilitate a holistic set of services for farmers, combining access to markets with access to production support that can include finance, advisory, production technology, and/or inputs. Some Platforms design set "bundles" of these services to farmers (e.g., RtMA, Agribuddy, Digifarm), while others facilitate a more open menu of services to choose from (e.g., Portal del Campo, DeHaat).

Other value-added services: Due to the complexity and broad nature of interactions facilitated, more than two-thirds of these models include physical distribution capabilities (in-house or third party) and almost all work with in-house or micro-entrepreneur field agents to recruit and support farmers and facilitate offtake. In addition to enabling access to more traditional production advice (e.g. Ricult) many Platforms also provide access to pricing information (e.g., Lima Links) or weather information (e.g., Portal del Campo). Integrated farm services marketplaces can generate rich data from multiple types of interactions, and a number use this data to provide agribusinesses, development actors, financial service providers, and governments with business intelligence and farmer profiles.

Level of curation: Most models very actively curate the providers that operate on the Platform (e.g., Digifarm), often leading to a limited number of providers in different service categories.

Access: Access ranges from mobile apps (e.g., Tioman Grow) to non-smartphone-based USSD mobile systems (e.g., Digifarm). Many work with field agents and/or rural service centers.

Platform providers and business models

- Tech company (14)
- Mobile network operator (1)
- Agri-business or ag goods/service provider (3)
- Government
- Other non-ag (1)
- Other

Market fit: Typically applied to highly disaggregated production markets where farmers lack access to multiple goods and services. In most cases, integrated farm services marketplaces fill multiple interrelated gaps in dysfunctional markets, rather than improving on markets that are already working.

Providers: While most Platforms are operated by tech players (often social enterprises), a larger proportion compared to other types are run by mobile network operators or agribusinesses that are building on their core business infrastructure, relationships, and capabilities to create a complementary Platform model.

Revenue model: Most models cross-subsidize lower margin advisory, input, and farm technology services with higher margin offtake services and/or donor funding. While each of these services have different revenue models, the way in which these fees are passed on to the farmer depends on how they are offered (e.g., bundled vs. menu of services). Data monetization is also widely seen as a high potential source of revenue, though few models have been able to monetize it (e.g., Agribuddy business intelligence insights). As these models often fulfill a market-building and smallholder support role, approximately half of all models receive donor funding (for some this is the most significant source of funding).

Early success: On average, these are largest in scale among the Platform types: more than half serve over 500,000 (e.g., Ricult, EzyAgric) or even over one million farmers (e.g., E-Choupal, Digifarm). Some Indian Platforms have raised significant commercial funding (e.g., DeHaat).

Examples

DigiFarm, operated by Safaricom, is an integrated mobile Platform that offers farmers one-stop access to a suite of information and financial services, including inputs, customized information on farming best practices, access to credit and other financial facilities, and access to markets.

Agribuddy provides a mobile and web-based Platform for farmers to access loans and farm inputs, and connect with buyers. In addition, farmers access knowledge on agronomic practices and weather information. The Platform uses "buddy" field agents—local entrepreneurs who support farmers and collect data.

* 1 Platform is active in both Africa and Asia and is therefore double-counted

Source: ISF Advisors and RAF Learning Lab analysis
6. Farm Services Rental Marketplace

Digital marketplace for farm machinery and equipment, such as tractors. Typically links farmers to vehicle owners/operators, which in many cases are small businesses or individuals.

Models Profiled: 5
- Africa: 3
- Asia: 2
- Latin America: --

Interaction and services overview

- Input supply & pre-production
- Production
- Post harvest & transport
- Trading & marketing
- Wholesale
- Retail & consumption

Value proposition: For farmers, better access to affordable tractor services, allowing them to mechanize their farms more efficiently, increase yields, and reduce the need for labor. For tractor owners, access to demand that enables higher utilization of their tractors and higher income.

Core service offering: Models profiled focus exclusively on tractor services rental with an open marketplace that includes digital listings, payment processing, and a fulfillment management system.

Other value-added services: There are a number of variations to this core services model that are emerging, including:
- Focusing on fleet management: HelloTractor appears to be shifting its focus to support fleet owners instead of individual tractor owners with a range of broader fleet management services.
- The use of a franchise model: Tringo actively recruits and supports the establishment of franchise owners of tractors to participate on the Platform.
- Holistic support: EcoFarmer (a mobile network operator in Zimbabwe) facilitates farm equipment rental as a Platform function alongside a number of other services, including finance, insurance, and advisory services.

Level of curation: Most models are open, allowing any farmer and tractor owner/operator to use the Platform. One Platform (run by tractor manufacturer JFarm) works with an Indian state government (Rajastan) to help tractor and equipment owners set up a rental business; in this model, tractor owners must apply and be accepted for the relevant subsidies.

Access: Most offer web-based access, with one (HelloTractor) using booking agents.

Platform providers and business models

<table>
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<tr>
<th>Tech company (2)</th>
<th>Mobile network operator (1)</th>
<th>Agri-business or ag goods/service provider (2)</th>
<th>Government</th>
<th>Other non-ag</th>
<th>Other</th>
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Market fit: Dependent on suitable context: i) availability of farming equipment and owners willing to rent their equipment out; ii) farmers growing crops that benefit from mechanization; and iii) farming economics allowing farmers to pay for farm equipment rental (in many cases, smallholder farms use low-cost labor as a less costly alternative to mechanization). In addition, regulations need to allow for gig-economy models.

Providers: Two of the five profiled Platforms (India-based Tringo and JFarm) are run by tractor equipment manufacturers—among the only examples in our entire analysis of a pipeline business branching into Platform functions to benefit their core business. Two Africa-based tech players have set up farm services rental marketplaces (TroTroTractor and HelloTractor), while a Zimbabwe-based MNO-run Platform (EcoFarmer VayaTractor) offers tractor rental facilitation as part of a wider range of services (most of which are run as pipeline rather than Platform services).

Revenue model: Barring one tractor company (which cross-subsidizes its Platform from core business revenues), all generate revenue mainly (or only) from transaction fees. While several Platforms advertise as “Uber for tractors,” in many cases they operate closer to a software as a service solution aimed at owners and operators of larger fleets of tractors, in which case they also generate member or subscription fees for use of the fleet management software.

Early success: While there is a lot of excitement around these models and most seem to be operating at some scale, the small number of providers and use of donor funding/cross-subsidization suggests challenging economics and scalability. These Platforms tend to struggle with their highly localized nature (tractor operators can serve a relatively limited geographic area), the seasonality of demand for tractor services (leading to periods of low demand), and the challenging economics of many smallholder farms (limiting their ability to hire tractor services).

Examples

TROTRO Tractor uses technology to make agricultural machinery services available, accessible, and affordable for farmers, who can access agricultural machines like tractors, crop care, and harvesting/processing equipment using their mobile phones. Tractor owners can get access to farmers using the Platform.

Hello Tractor focuses on connecting tractor owners and smallholder farmers in sub-Saharan Africa through a farm equipment sharing application. Their software also helps larger fleet owners manage their entire operations.

Source: ISF Advisors and RAF Learning Lab analysis