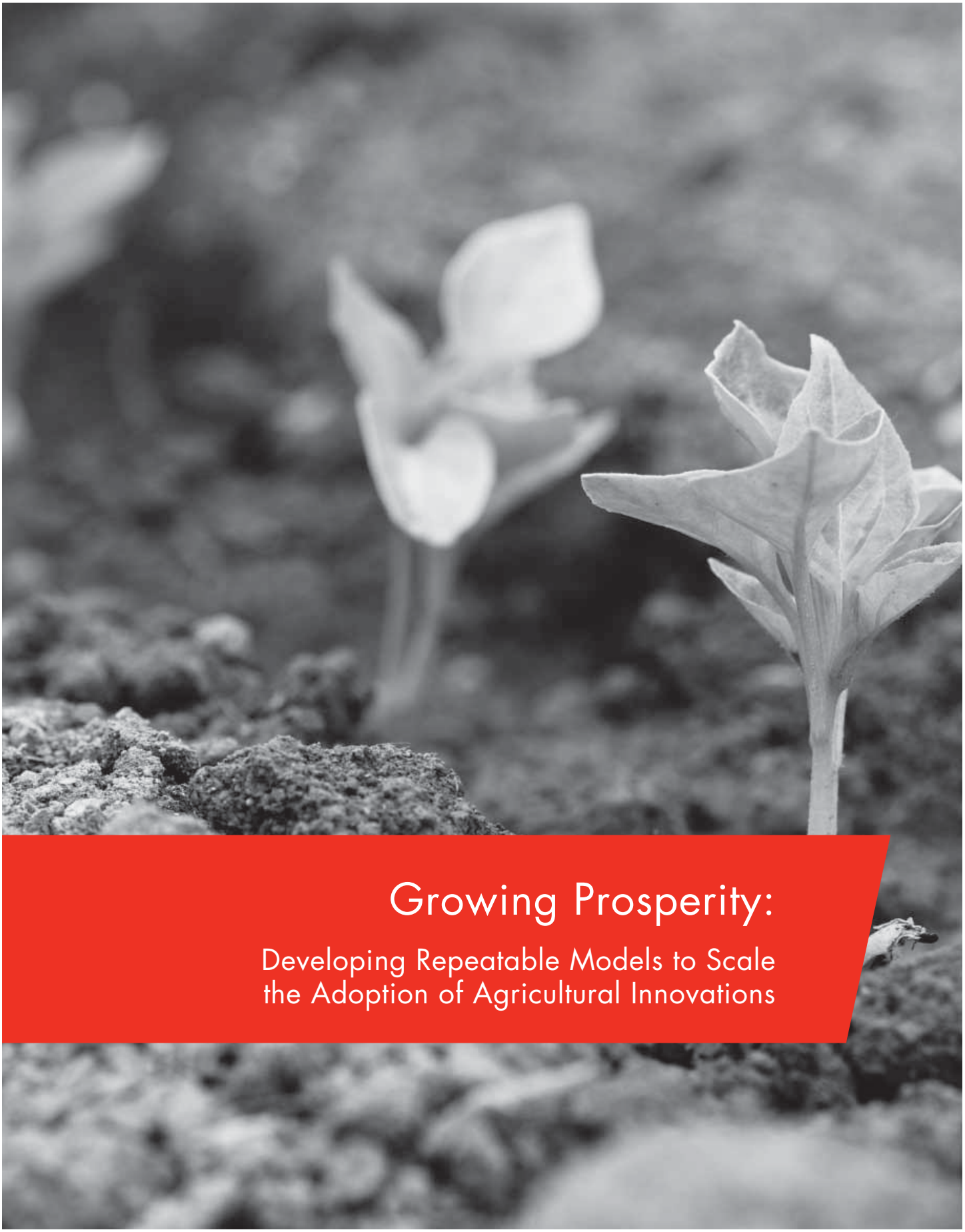

Growing Prosperity:

Developing Repeatable Models to Scale the Adoption of Agricultural Innovations

ACUMEN
CHANGING THE WAY THE WORLD TACKLES POVERTY

BAIN & COMPANY

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The Bill & Melinda Gates Foundation works to help all people lead healthy, productive lives. In developing countries, it focuses on improving people's health and fighting hunger and poverty. In the United States, it seeks to significantly improve education so that all young people have the opportunity to reach their full potential.

This publication is based on research funded in part by the Bill & Melinda Gates Foundation. The findings and conclusions contained within are those of the authors and do not necessarily reflect positions or policies of the Bill & Melinda Gates Foundation.

Contents

We live in an extraordinary time.

Knowledge is progressing at an unprecedented pace, and never before in history have we had the resources, skills, technologies and imagination needed to create a more prosperous and sustainable future for all. Yet for the world's most vulnerable, that future will never materialize without more focused action.

Most of the world's poor, nearly 2.5 billion people, live off the land. These smallholder farmers survive by farming small plots of land about the size of a football field. Their 500 million farms produce up to 80% of the food supply in Asia and sub-Saharan Africa, yet many of the people living on these farms are themselves struggling to survive.

These smallholder farmers are especially vulnerable to changes in the economic environment, market fluctuations and the consequences of globalization, such as increased competition against lower prices from international trade. In addition, widespread illiteracy limits the ability of many smallholder farmers to access the right information at the right time, including the availability of new innovations, agriculture techniques, weather forecasts, current market prices and more.

Now more than ever we have the technology and the innovations to make a difference. Better farming techniques, improved seeds, demand for organic and fair trade products and the integration into global supply chains have the chance to lift hundreds of millions out of poverty. Yet in most cases, these innovations aren't reaching the smallholder farmers who need them most.

However, there are a growing number of entrepreneurs who are trying, and succeeding, in reaching these farmers, in building businesses that both create a profit and help farmers work their way out of poverty. These "pioneer firms" may be the key to transforming the potential for smallholder farmers to make new and better lives for themselves and their children.

With support from the Gates Foundation, Acumen and Bain & Company partnered to understand what is needed to truly scale innovations to reach millions of smallholder farmers, so that incomes increase and entire communities can escape the poverty trap. The results of this work—which involved interviews with more than 320 smallholder farmers, sector experts and frontline employees at pioneer firms—are laid out in this groundbreaking new report, *Growing Prosperity: Developing Repeatable Models to Scale the Adoption of Agriculture Innovations.*

We know that helping smallholder farmers access better products that will allow them to increase production and incomes in a sustainable way, is the most effective way to reduce hunger and poverty over the long term. We also know that nothing will happen unless pioneer firms—those responsible for developing and delivering the necessary innovations such as microdrip irrigation systems, drought-resistant hybrid seeds and asset-backed microloans—are able to find new, effective ways to profitably serve these hard-to-reach customers at scale.

The time to accelerate progress is now, and it is clear the solutions will come not from one sector, but from all sectors. For if we are to succeed, and we must, we all have a role to play. Whether demonstrated through Unilever's commitment to building inclusive supply chains that provide smallholder farmers with demand for their agricultural outputs and strengthen their capacity or Acumen's financial and technical support of individual pioneer firms and their innovations, business as usual is no longer good enough.

Our vision is one of freedom and dignity for each and every individual, no matter where he or she is born. And to get there, we must leverage the power of partnerships not only in growing prosperity but in cultivating human flourishing to ensure a more meaningful and lasting prosperity.

Paul Polman
CEO, Unilever

Jacqueline Novogratz
Founder and CEO, Acumen

Smallholder farmers in Africa and elsewhere face many challenges.

In those regions where agriculture is the backbone of the economy, poor growing conditions, limited resources, rising temperatures and other impacts of climate change make sustainable farming difficult.

The good news is that many simple and affordable solutions exist to help farming families increase their productivity, and a growing number of pioneering entrepreneurs are working on the front lines of development to help farmers create a better livelihood for their families.

As *Growing Prosperity* notes, smallholder farmers in India now have access to affordable and easy-to-maintain microdrip irrigation systems that increase yields while using less water. In several East African countries, farmers can purchase high-quality agricultural inputs on credit and tap local experts to optimize crop yields. In Ghana, a local agri-food company is providing rice farmers with high-quality seeds on credit and motivates the use of better farming practices by paying a premium based on the quality of a farmer's harvest.

These innovators have an important role to play in filling a gap in the marketplace unmet by governments and traditional donors. Yet, as this report explains, many entrepreneurs face an uphill battle getting their products to the people who need them. Their customer base is hard to reach and has limited disposable income. Often, smallholder farmers are unwilling to assume the risk of investing in products that are unfamiliar to them. And many entrepreneurs lack the fundamentals necessary to scale and sustain a viable business model.

As this report highlights, part of the solution lies with pioneer companies doing a better job of demonstrating the value of their products, offering realistic purchase options, and being able to sustainably scale their business at a pace to meet market demand.

Governments, development agencies, NGOs, foundations and private sector investors also have an important role to play in the success of these companies through their investments, policies and the expertise they can offer.

At the Bill & Melinda Gates Foundation, much of our focus historically has been on upstream R&D to develop new and better seeds that increase yields, are more resistant to disease and more resilient to the shocks associated with climate change. This remains an important area of investment. At the same time, we also are working with partners to get better tools into the hands of farmers, reduce the barriers between farmers and markets, and strengthen policies that help farming families become more a part of a functioning private-sector agricultural and food system.

Many of the issues and opportunities outlined in this report apply to the delivery of solutions in other sectors—such as healthcare, nutrition, financial services, sanitation and education—and to the businesses and government agencies working to meet the needs of the poor.

Over the long term, those of us working in global development will be most effective if we start with a good understanding of the customer and an appreciation that their needs often extend across multiple sectors. Success requires that we look continuously across all of these sectors as we identify the systems and channels necessary to deliver the tools and services people want and need in their daily lives. In many cases, providing a particular intervention, product or service may be more effective, and less costly, if we bundle it with other activities and resources that people regard as valuable.

Growing Prosperity offers valuable insights that can significantly increase the contribution of pioneering entrepreneurs. To sustainably increase agricultural productivity, the entire sector must unite to ensure that smallholder farmers have the tools and resources they need to live healthy and productive lives.

Chris Elias
President, Global Development
Bill & Melinda Gates Foundation

Growing prosperity: An overview

This overview introduces the challenges facing the developing world's smallholder farmers who rely on agriculture for their livelihood. By adopting products and services from pioneer firms—entrepreneurial companies that develop and offer market-based innovations to serve the poor in places where governments and traditional aid have fallen short—these customer farmers could improve their lives and the lives of future generations. But what will it take to get them to buy these products and services over and over again?

"If you care about the poorest,
you care about agriculture."

—Bill Gates

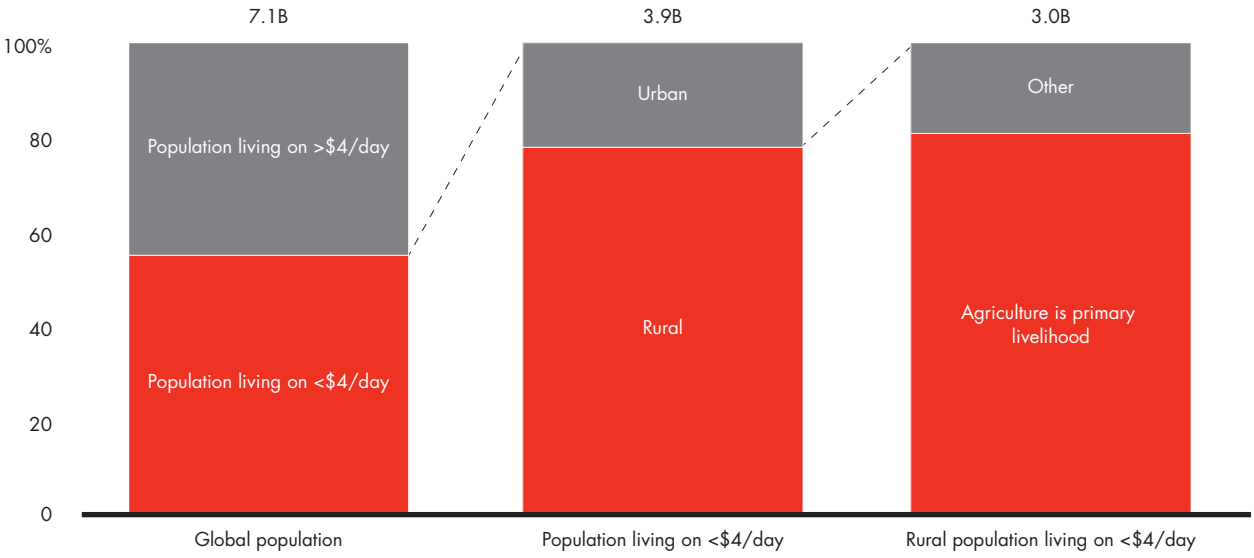
Growing prosperity: An overview

Microdrip irrigation systems. Drought-resistant hybrid seeds. Asset-backed microloans. These innovations can transform the lives of those farming on less than two hectares of land and living on less than $4 a day. Yet until relatively recently, they were unknown in most smallholder farmer communities.

What does it take to get the developing world's smallholder farmers to try one of these products? Importantly, what would it take to get them to buy these products again and again? For many of the 2.5 billion people living at the "base of the pyramid" and relying on agriculture for their livelihood,[1] adopting these innovations could improve their lives and the lives of future generations (*see Figure 1*).

These questions lie at the core of this paper. In recent years, innovations for smallholder farmers have frequently been introduced by *pioneer firms*—entrepreneurial companies that develop and offer market-based innovations to serve the poor in places where governments and traditional aid have fallen short. These firms provide smallholder farmers with access to products, services and markets, which can significantly improve their productivity, incomes and lives. Although pioneer firms have a social purpose, they are typically set up as for-profit companies, aiming to quickly and sustainably scale their operations and broaden their impact. While these firms offer huge promise, they face challenges that make their very existence, let alone their growth, extremely challenging. Not only are these firms looking to serve hard-to-reach customers with limited disposable incomes, they are doing so in the context of broader systems that are often broken. In reviewing the performance of agriculture-focused pioneer firms around the world, we found that very few had scaled[2] and even fewer had achieved both scale *and* profitability. What will it take to cross the Pioneer Gap[3] and have many more of these new, promising firms scale?

Figure 1: Globally, agriculture is the primary livelihood for an estimated 2.5 billion people



Note: Assumes rural/urban breakdown is broadly similar for those living on less than $1.25 a day and those living on less than $4.00 a day.
Sources: Pedro Olinto et al., "The State of the Poor: Where Are the Poor, Where Is Extreme Poverty Harder to End, and What Is the Current Profile of the World's Poor?" Economic Premise, no. 125, World Bank, October 2013; PovcalNet (an online poverty analysis tool developed by the World Bank's Development Research Group); IFAD, "Viewpoint: Smallholders can feed the world," February 2011

While there is extensive literature on agriculture in the developing world, it focuses primarily on the actions of nongovernmental organizations (NGOs), aid agencies and governments, as well as on farmers' decision making.[4] In addition, much of that literature has been narrowly focused on one crop or one technology in a certain region and lacks specific business implications to inform management decisions. Relatively little has been written about the actions of the pioneer firms themselves—how they develop and execute their strategy and operating model as they grow and, in the process, encourage broad adoption of their innovation.

This paper aims to fill that gap by focusing on the interaction between farmers and pioneer firms and what needs to happen to spur sustained adoption, allowing these firms to serve hundreds of thousands, or even millions, of smallholder farmers. Also, although scale continues to be a core focus (some may say an obsession) for the development sector, clearer analysis is needed on *how* a firm should achieve scale to encourage mass adoption of its innovation. Last, we examine the relationship between firm and farmer in the wider market system context, considering how corporations, foundations and development agencies, impact investors, NGOs and the government can influence adoption and support the successful scaling of pioneer firms.

Our primary audience for this paper is the practitioners themselves: the management teams of agriculture-focused pioneer firms. To address the questions above, we have built on the existing literature on pioneer firms, particularly *From Blueprint to Scale: The Case for Philanthropy in Impact Investing*, published by Acumen and Monitor Inclusive Markets, which advocates for the crucial role that philanthropy plays in supporting these companies.

Key findings

Three key findings from our research point to what pioneer firms and other actors must do to spur greater adoption of agricultural innovations by smallholder farmers.

First, pioneer firms must systematically ensure that the "Four A's" (awareness, advantage, affordability and access) are continuously in place for their farmer customers (see the sidebar "Defining the Four A's of adoption").[5] Adoption starts with an unrelenting focus on the farmer: how to raise his or her *awareness* of new products and services, how to communicate and reliably deliver on the *advantage* the farmer will gain by adopting innovations, how to ensure the *affordability* of these innovations and how to provide easy and timely *access* to them. While these Four A's are not revolutionary,[6] we learned from our research that few firms are able to systematically address each of these elements in a sustained way as they grow. This is not surprising given the structural challenges of serving the

base of the economic pyramid and the inherent complexity firms encounter as they try to adapt to rural developing markets with often low levels of infrastructure and value chain development.

Second, pioneer firms must develop *Repeatable Models*® to achieve adoption at scale across villages, regions and countries (see the sidebar "Defining Repeatable Models"). This means having the right strategies, processes, teams and supporting systems to drive adoption of their innovation in an adaptive and increasingly efficient and effective manner, while ensuring their own sustained, profitable growth. In short, Repeatable Models help pioneer firms promote "good scale" that endures while avoiding "bad scale" that is unprofitable and unsustainable. In our research, firms pursuing bad scale had introduced costly complexity by prematurely expanding to adjacencies (new customers, products, geographies or capabilities), while those on the path to good scale were implementing aspects of Repeatable Models. Building Repeatable Models entails, among other things, defining the company's core market and distinctive competencies; establishing clear values, operating processes and market entry routines; appropriately hiring, training and managing the performance of employees; and developing and institutionalizing the customer feedback and learning systems that inform management as to whether and how the Four A's are in place and that guide ongoing efforts for improvement and innovation.

Third, other actors across the agricultural system should tailor their actions to enhance the Four A's and help pioneer firms develop and scale their Repeatable Models to bring their products and services to more farmers. Though an understanding of the key factors of adoption and scale are paramount, firms and farmers do not exist in isolation—they operate within a wider market system. This system can either promote the Four A's and enable the firm to develop its Repeatable Model or hinder the firm's success and slow down adoption. There are clearly examples of pioneer firms that, by virtue of their innovation and first-mover nature, disrupt and change part of a failing system; nonetheless, no single firm can rewire an entire system. Further, as the firm begins to reach scale of any significance, its interactions with this system (rules and regulations, infrastructure, access to finance and supporting inputs) and other key players (including competitors) will become more central to its success. Therefore, corporations, foundations and development agencies, impact investors, NGOs and the government should design investments, interventions and policies that promote the lasting success of pioneer firms and the smallholder farmer customers they serve.

The agriculture sector requires considerable investment by all sector actors to build a robust and supportive ecosystem, and it needs more capital from investors who take the long view and value social returns. We are encouraged by the ingenuity and perseverance of the many pioneer

Defining the Four A's of adoption

Awareness: Awareness is the knowledge that a farmer possesses about a product or service. This includes knowledge of a product or service "category" (e.g., a microfinance loan or microdrip irrigation), the knowledge of a specific company's offerings as well as the knowledge of how the product or service should be used.

Advantage: Farmers will be motivated to adopt an innovation if they are convinced that the product or service will provide better outcomes than current practices—if an innovation promises to increase their wealth with higher crop yields or better prices for their outputs, for example, or if it can reduce expenses with lower labor and input (e.g., water, fertilizer) costs. Benefits may also take the form of reduction of income risk associated with output price volatility or crop failures stemming from weather or disease. Advantage can also come in the form of improved social standing within the community.

Affordability: Affordability is the extent to which farmers are financially able to purchase a product or service. The innovation must be affordable not just in terms of the absolute price; it must also be available for purchase at that price when farmers have money in their pockets based on their cash-flow cycles. Given cash-flow variability over the year, it may also be necessary for the farmer to have access to financing to make the product truly affordable.

Access: Access is defined by the ease, distance and timing of the procurement and sale of an agricultural innovation. Farmers have good access if the product or service is available, when they need it, at a location that they can easily get to.

Defining Repeatable Models

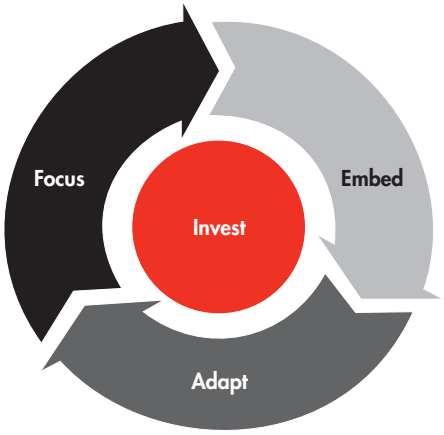
The best Repeatable Models are built on the root cause behind a company's greatest successes, and they enable the company to replicate these successes over and over again with new customers, geographies, even new products. Repeatable Models help pioneer firms drive adoption of their innovation in an adaptive and increasingly efficient and effective manner, while ensuring their own sustained, profitable growth. Building a Repeatable Model requires addressing four fundamental questions:

Focus

What is your "core," and how should you prioritize your growth options?

Invest

Are you investing in talent and systems that will set you up for long-term growth?



Embed

Have you established the routines and culture to consistently translate your strategy into action?

Adapt

Have you set up the feedback and learning systems to continually adapt and innovate?

Source: Bain analysis

firms we have studied for this paper, but more must be done to support their work. As many management teams at pioneer firms have told us, the work is consistently challenging and takes a very long time to "get right," and the rewards, in terms of impact and financial returns, are often uncertain at this early juncture.

The work of these pioneer firms is simply too important to remain sub-scale, and there is potential for a real breakthrough in the next 5 to 10 years. With this study, we hope to shift the odds more in favor of pioneer firms and the smallholder farmers they serve. We hope that current and aspiring entrepreneurs, as well as other system actors, will find in this study a clear roadmap for motivating those farmers to adopt innovative, value-creating products and services. If successful, this study will help accelerate results for all involved and, in so doing, contribute to our collective efforts to create growing prosperity.

1 IFAD, "Viewpoint: Smallholders can feed the world," February 2011.

2 In reviewing the performance of 100 pioneer firms focused on selling to or buying from smallholder farmers in South Asia and sub-Saharan Africa, we found less than 5% with more than 250,000 customers or 25,000 suppliers in a single year.

3 The term "Pioneer Gap" was first coined in Harvey Koh, Ashish Karamchandani and Robert Katz, *From Blueprint to Scale: The Case for Philanthropy in Impact Investing*, Mumbai: Monitor Inclusive Markets/Acumen, 2012, and is defined as the gap between the time a pioneer firm starts and the time it becomes a viable and investible enterprise.

4 See Abhijit Banerjee and Esther Duflo, *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*, New York: Public Affairs, 2011.

5 This framework is similar to a core observation made by C. K. Prahalad, "This population [the base of the pyramid] does not typically have access to world-class products or services or to regional and global markets for their effort and production. Awareness, access, affordability, and availability continue to be the problems" (Ted London and Stuart L. Hart, *Next Generation Business Strategies for the Base of the Pyramid*, Upper Saddle River, NJ: FT Press, 2010). Prahalad also used the term "4 A's," referring to awareness, access, affordability and availability in "Bottom of the Pyramid as a Source of Breakthrough Innovations," *Journal of Product Innovation Management* 29, no. 1 (2011): 6–12.

6 C. K. Prahalad's articles for *The Journal of Product Innovation Management* lay out his own Four A's (awareness, access, affordability and availability) to stress how innovating to serve the bottom of the pyramid can prompt significant returns for corporations.

1.

A starting point: On the path to prosperity

This chapter focuses on why smallholder farmers matter and why it is so important to address the challenges faced by pioneer firms in serving them. We introduce 11 pioneer firms that are developing innovative products and services to increase smallholder productivity and incomes.

"While the Green Revolution benefited many farmers, the adoption of promising agricultural technologies has remained particularly low among the poor."

—*Agriculture Technology Adoption Initiative (ATAI)*
White paper, 2013

A starting point: On the path to prosperity

Agriculture is the primary livelihood for most poor people in the world today. We will not be able to address global poverty if we do not devise large-scale solutions that improve the livelihoods of smallholder farmers. The need to encourage smallholder farmers' widespread adoption of agricultural innovations is especially relevant in the countries we focused on for this study: India, Pakistan, Uganda, Kenya and Ghana. More than a billion people earning less than $4 per day live in rural areas in these countries, and agricultural workers' percentage of the national labor force ranges from 45% in Pakistan to 82% in Uganda.[7]

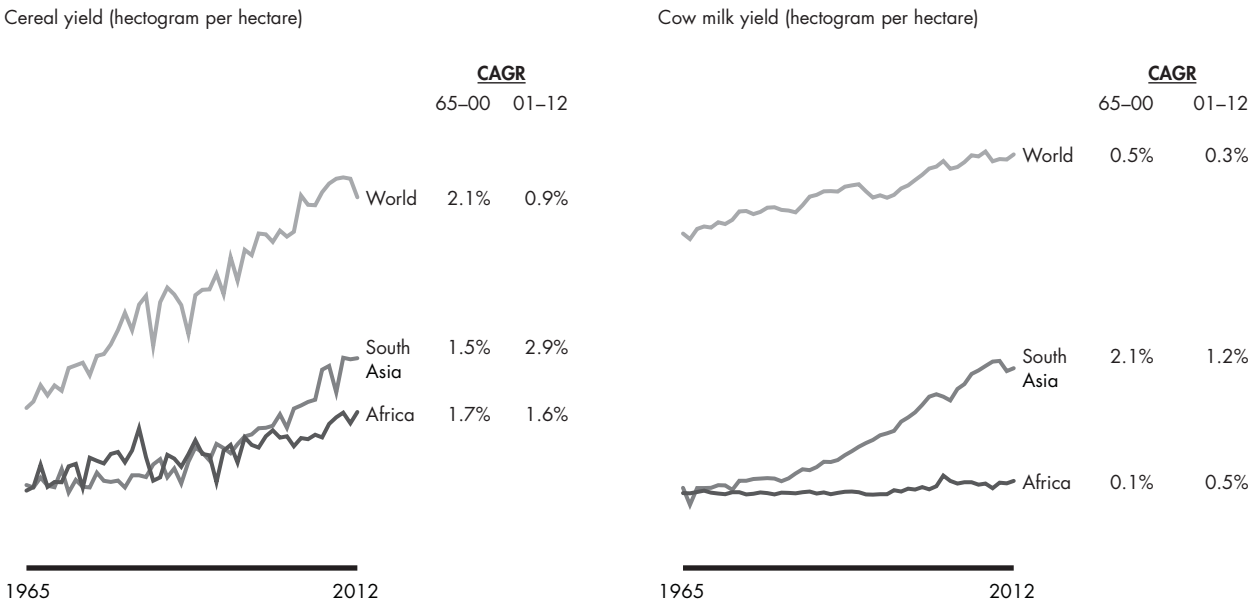
Why smallholder farmers matter

Smallholder farmers are important producers of agricultural goods. While many produce largely for their own consumption, they are increasingly becoming part of global value chains. For example, smallholder farmers produce more than 80% of the world's coffee and 90% of the world's cocoa.[8]

Yet farmers' productivity in developing countries significantly lags behind productivity in developed markets: Cereal yield per acre in Africa is less than one-half of the global average, and milk production per cow is less than one-quarter of the global average (*see Figure 2*).[9]

This productivity gap is, in large part, the result of infrequent and inconsistent application of basic agricultural technology and techniques. Practices that are commonplace in wealthier countries and that have underpinned various "green" revolutions are largely absent in the poorer parts of the world. For example, sub-Saharan Africa has a regional average fertilizer usage of less than 10 kg per hectare compared with the

Figure 2: Agriculture in South Asia and Africa remains far less productive than the world average



Source: FAOSTAT

world average of 11 times that number,[10] and in India, 65% of arable land is still rain-fed.[11] Previous research has shown that simple products like drip irrigation, fertilizer and high-yielding seeds could increase global crop yields by as much as 67%.[12] This is all the more urgent as the world's population approaches 9 billion and food consumption is expected, by 2050, to grow by 40% from today's levels.[13] If we cannot catalyze the widespread adoption of agricultural innovations, the twin blights of poverty and food insecurity will remain or may even worsen.

The challenges for smallholder farmers are numerous. Their incomes are low, many are relegated to marginal lands and growing populations and inheritance practices mean smaller and smaller farms, undermining the ability of these farmers to apply technologies that work in the developed world. We need more innovations optimized for these farmers, innovations that address immediate needs for productivity gains and that are sold in ways that reflect an understanding of how farmers really make decisions and how wealth is created and sustained across the agricultural system.

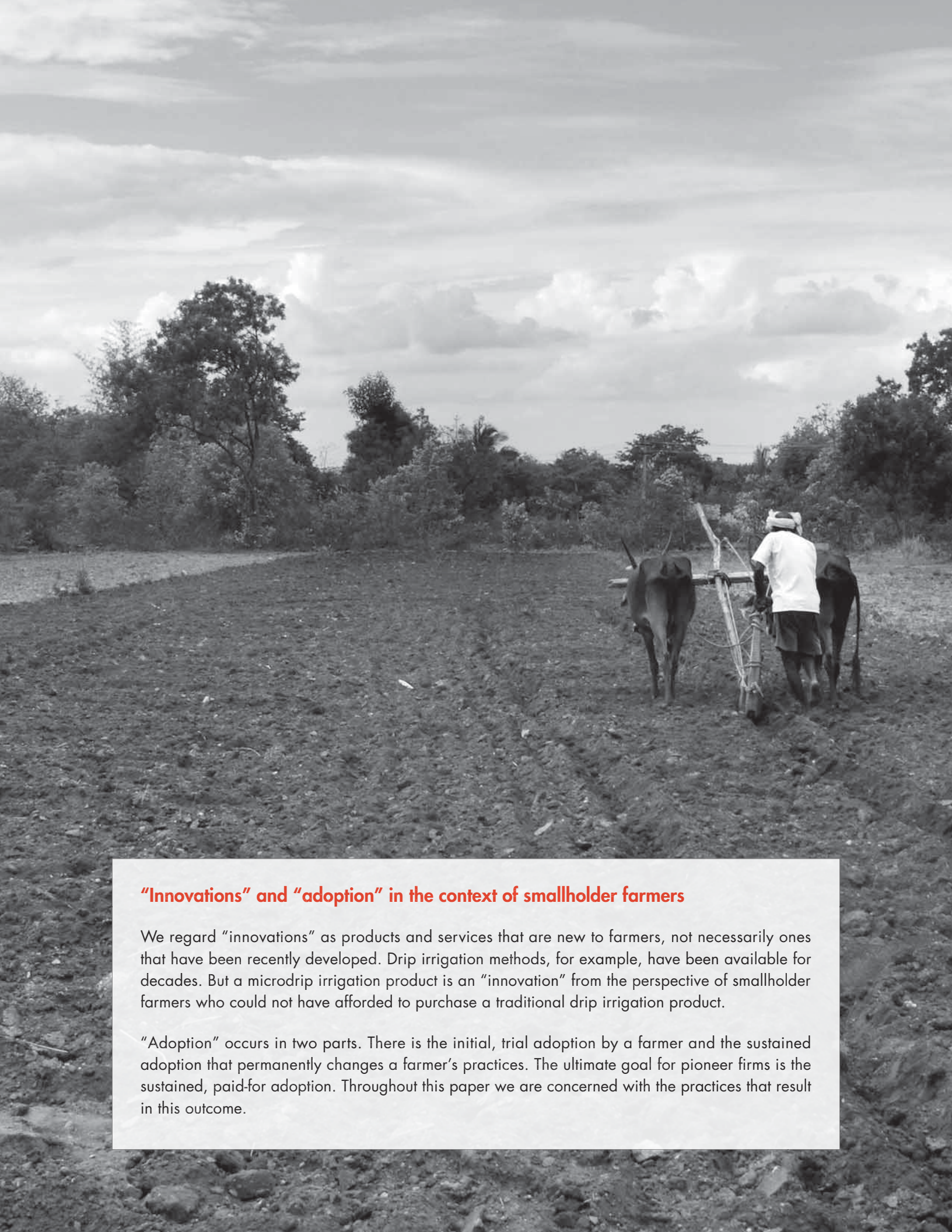
We found four factors, the Four A's, to have the most explanatory power for what promotes adoption of these powerful agricultural innovations: *awareness, advantage, affordability* and *access*. The Four A's help firms assess whether they have addressed the most immediate incentives of adoption for smallholder farmers. Although this paper emphasizes the specific practices relevant to smallholder farmers, the framework of the Four A's can usefully be applied by pioneer firms serving low-income customers across a variety of sectors.

Why aren't pioneer firms consistently delivering on the Four A's of adoption today?

Pioneer firms are selling to what are perhaps the most challenging customers in the world: low-income, smallholder farmers whose decision to adopt an agricultural innovation directly affects household income and their ability to feed their families. The dispersion of these farmers across rural areas, the significant time lags between the use of a product (e.g., better seeds, an irrigation system) and their realized benefits (when crops are consumed or sold) and the diverse environmental and agronomic conditions in which these farmers operate all make it difficult for firms to serve these farmers efficiently and effectively.

As small start-ups targeting a hard-to-serve customer segment, the firms themselves can struggle to access personnel, low-cost capital and—critical in agriculture—partners across the value chain, from field to table. They struggle to formulate their strategy and operating model, given that every region they operate in presents new challenges and obstacles. This situation can often be further complicated by challenging market systems, including poor physical infrastructure or government intervention, as well as pricing policies that effectively restrict access to markets and reduce or eliminate incentives to compete.

Finally, exogenous factors like disease and weather can wipe out any gains from adopting an innovation. Consequently, agricultural innovations often do not spread far and wide enough, the firms that develop them have



"Innovations" and "adoption" in the context of smallholder farmers

We regard "innovations" as products and services that are new to farmers, not necessarily ones that have been recently developed. Drip irrigation methods, for example, have been available for decades. But a microdrip irrigation product is an "innovation" from the perspective of smallholder farmers who could not have afforded to purchase a traditional drip irrigation product.

"Adoption" occurs in two parts. There is the initial, trial adoption by a farmer and the sustained adoption that permanently changes a farmer's practices. The ultimate goal for pioneer firms is the sustained, paid-for adoption. Throughout this paper we are concerned with the practices that result in this outcome.

To overcome the barriers to smallholder farmer adoption at scale, patience is a necessity, not a virtue

trouble reaching scale and profitability and large numbers of smallholder farmers fail to gain access to productivity-enhancing products and services.

The primacy of the firm

Much of the conversation surrounding the power of the private sector for development has rightly focused on the ability of private companies to scale up to serve hundreds of thousands or even millions of customers. The recent Monitor–Deloitte study *Beyond the Pioneer: Getting Inclusive Industries to Scale*[14] highlights the importance of creating the right enabling environment to accelerate firms' success. The report focuses on the role that "industry facilitators" can play in addressing barriers to scale for firms and for the wider business system in a given sector and region.

We agree that sector building is vital, and we make specific recommendations in this report for ways corporations, foundations and development agencies, investors, NGOs and governments can individually and collectively enable sector development and growth, based on examples of what has worked. However, we also believe that insufficient focus has been placed on the pioneer firms themselves, especially on their development and execution of strategies and operating models as they scale and, in the process, drive adoption of their innovation. Although there are certainly major capital gaps and a dire need to develop the right enabling environment in which firms can succeed, nothing will happen without a larger number of successful pioneer firms finding ways to profitably serve these hard-to-reach customers at scale. By understanding what is working in this primary point of contact between firms and end customers, whether in agriculture or otherwise, and how to better enable this success, all the relevant actors in this system can better assess what they should and should not do.

That is why the pioneer firm is our starting point for analyzing how to put more smallholder farmers on the path to prosperity. This report provides a foundation for understanding and addressing issues of adoption by starting at the center of this challenge.

As pioneer firms know all too well, the challenges to achieving sustained adoption at scale are formidable. Acquiring a clearer understanding of smallholder farmers as customers and building Repeatable Models in frequently underdeveloped systems are notoriously hard and can take a long time. Our research reinforces the notion that patience is a necessity rather than a virtue when seeking to overcome the barriers to smallholder farmer adoption at scale.

Shining a spotlight on 11 pioneer firms

We conducted in-depth research into the practices of 11 pioneer firms that develop products and services to meet the needs of smallholder farmers. Throughout this report, we use these case studies to illustrate practical solutions to the challenges of delivering on the Four A's and developing Repeatable Models. Although pioneer firms are only one type of actor in a complex system, they are well positioned to understand the needs of smallholder farmers and connect them to broader value chains in a fairer and more transparent manner. Consequently, these case studies offer insights that can help to unlock value throughout the system.

To ensure that the case studies covered a diverse cross-section of organizations, we selected firms from Acumen's agriculture portfolio as well as other companies and organizations. We sought diversity with respect to four dimensions:

- **Regions served:** The selected firms serve farmers in South Asia (India and Pakistan) or sub-Saharan Africa (Ghana, Kenya and Uganda).
- **Sectors served:** Firms offer products or services relating to cash crops (for example, chili peppers and cotton), staple crops (rice, maize and sorghum) or livestock (cows and poultry).
- **Value-chain segment:** Some firms provide agricultural inputs (irrigation equipment, seeds or comprehensive packages), whereas others purchase outputs (crops or milk) or offer services.
- **Stage of maturity:** The firms range from early-stage companies in their first one to two years of operation to mature companies operating for more than 10 years.

To understand each of the firms we studied, we analyzed internal company data and conducted extensive interviews with the founders, key members of the management team and frontline staff. As would be expected, some of these companies have struggled at various times to determine their optimal business model. We highlight their challenges as well as their successes in this report so that other firms can benefit from the full range of their experiences.

Among the 11 firms we studied, five are featured most prominently:

Global Easy Water Products (GEWP) markets and distributes low-cost microdrip irrigation products to smallholder farmers in India. The firm began operations in 2004 as a for-profit spin-off from International Develop-

ment Enterprises India (IDEI), an NGO specializing in irrigation. In 2013, GEWP had approximately 21,000 customers and revenues of $2.3 million. GEWP is an Acumen investee.

GEWP's most successful product is drip tape, a simple irrigation solution that the company produces in different thicknesses to correspond with requirements for short-term crops (e.g., vegetables) and long-term crops (e.g., tree crops). The company procures microdrip irrigation equipment from local contract manufacturers and distributes its products through a network of private local distributors and retailers. The firm also provides accessories for the installation of microdrip irrigation systems, including control valves, filters and fertilizer systems.

Juhudi Kilimo is a microfinance company providing asset-backed loans to smallholder farmers in Kenya that enable them to buy productive assets, such as dairy cows. The firm also provides business support and technical assistance in the form of training for their borrowers. Juhudi Kilimo was founded in 2004 as an agribusiness initiative within the K-Rep Development Agency, a microfinance NGO. By 2009, Juhudi Kilimo had become an independent for-profit social enterprise. In 2013, its loan book totaled approximately $5.8 million with revenues of $1.7 million. The firm serves 20,000 clients and has set a target of reaching 100,000 clients by 2015. It has approximately 150 employees across 20 branch offices in southwestern Kenya. Juhudi Kilimo is an Acumen investee.

Unlike traditional microfinance, which primarily provides loans for working capital, Juhudi Kilimo finances specific agricultural assets that offer immediate and ongoing income for farmers. Loans for dairy cows make up approximately 45% of its portfolio. Other financed assets include poultry, irrigation equipment and transportation equipment. These assets are insured to protect both clients and Juhudi Kilimo from business losses. The company reduces farmers' risk of further indebtedness by using the assets as a form of collateral in case of default. Groups of clients (typically groups of five) co-guarantee their loans and support one another with oversight from Juhudi Kilimo's loan officers. Farmers within these groups share ideas and encouragement, learn about new products and services and organize for access to better pricing and markets.

Through training, technical assistance and capital, Juhudi Kilimo helps smallholder farmers develop larger agribusinesses. To grow markets for smallholder farmers, it also supports rural enterprises such as milk-chilling plants, coffee mills and mango-processing plants.

One Acre Fund (OAF) is a nonprofit organization providing smallholder farmers in East Africa with a comprehensive "market bundle" that includes farm inputs on credit, delivery of inputs, training and facilitating harvest sales. OAF began operations in Kenya in 2006 and has expanded to Rwanda (2007), Burundi (2012) and Tanzania (2013). By 2013, it was serving 130,000 farmers operating on more than 87,000 acres. It has set a target for 2014 of serving more than 200,000 farmers operating on 137,000 acres. According to OAF, its farmers have raised their incomes by 52% per acre planted, representing an increase in annual profit per farmer of $139.

In Kenya, OAF provides an $80 loan per one-half acre in the form of farming inputs: seeds and fertilizer. It delivers these inputs within walking distance of the farms it serves and offers training to farmers on how to use them effectively. OAF also helps increase harvest sales by providing safe storage and connections to local traders.

OAF has approximately 2,600 full-time employees. To grow the customer base, staff members visit new markets and use training and demonstration pilots to educate farmers on the market bundle's benefits. OAF maintains its presence in the villages through weekly training conducted by its field officers.

Unlike traditional microfinance, which primarily provides loans for working capital, Juhudi Kilimo finances specific agricultural assets that offer immediate and ongoing income for farmers.

Sidai operates franchised and branded Livestock Service Centers that provide inputs and veterinary services to farmers in Kenya. The company is working to address the significant problems farmers face in getting access to quality products and services. There are many substandard or counterfeit products on the market, and most retailers are unqualified to give reliable technical advice to farmers. As a result, farmers waste a lot of money on unnecessary purchases and often don't use what they purchase correctly. Founded in 2011, Sidai is a for-profit company of the nonprofit Farm Africa. The firm currently has six company-owned stores and 70 franchised centers across Kenya and had revenues of $1.4 million in 2013. It intends to establish a network of at least 150 service centers by 2015.

Sidai offers numerous products for livestock, including antibiotics, vaccines, feeds and multivitamins. It also sells crop inputs, including agrichemicals, fertilizers and seeds. The firm complements these offerings with on-farm services to provide preventive healthcare for livestock and improve productivity.

The company's service centers are owned and run by veterinarians, livestock technicians and other livestock professionals. To support franchisees, Sidai obtains quality products, offers business training and, if required, helps franchisees gain access to finance to launch or grow their operations.

SV Agri provides an end-to-end value chain for smallholder potato farmers in India by delivering necessary inputs (including high-quality potato planting materials) and connecting farmers with commercial buyers. The firm, which began operations in 2008, was started by a team with 40 years of combined experience in managing agribusiness supply chains for major corporations. It currently has more than 125 franchisees operating in seven Indian states.

The firm focuses on creating value across the potato supply chain by blending knowledge of agriculture, processing and technology. It supplies good-quality potato planting material to farmers with the support of the Central Potato Research Institute in Shimla for the transfer of aeroponic technology to produce tubers at significantly lower costs. Its rural distribution program provides smallholder farmers with pesticides and fertilizers in addition to planting materials. The firm also seeks to improve the performance of small and midsize processors by providing technical solutions and equipment.

SV Agri recruits franchisees with a commitment to the firm's mission and supports the franchisees by providing training, marketing and financial guidance.

Our discussions with six other firms were valuable in shaping the insights discussed in this report:

BASIX Krishi is a part of the BASIX Group, a pioneer in providing services for rural development. It started operations as the Agricultural Business Development Services division within BASIX Group's microfinance arm. The organization is now piloting the provision of

One Acre Fund began operations in Kenya in 2006 and has expanded to Rwanda, Burundi and Tanzania. By 2013, it was serving 130,000 farmers operating on more than 87,000 acres.

services for other institutions, including the National Bank for Agriculture and Rural Development and the state government. BASIX Krishi is an Acumen investee.

Gulu Agricultural Development Company (GADC) is a commercial cotton ginnery established to revitalize the agricultural economy in war-ravaged Gulu, Uganda. The firm procures its raw cotton directly from smallholder farmers while providing farmers with access to key inputs and extension services. Recently, the organization has evolved its business model to support sesame and chili farming in addition to cotton. GADC is an Acumen investee.

The Global Agri-Development Company (GADCO) is an integrated agri-food business in Ghana focused on rice production and processing and the marketing of cereal and protein-based foods. The company launched the Copa Connect program in 2013 to integrate smallholders into its rice value chain to supplement its existing 800-hectare nucleus farm. Through Copa Connect, GADCO uses technologies from its nucleus farm to benefit smallholders by providing inputs on loan, training and market access. The company has invested in a processing facility and continues to strengthen partnerships with leading organizations across the value chain. GADCO is an Acumen investee.

KK Foods aggregates fruits and vegetables produced by smallholder farmers in Uganda and exports them to Europe. It encourages farmers to switch from consumption crops to cash crops (such as chilies) and supports them with both inputs and training. The company currently accounts for up to 70% of the export of fruits and vegetables from Uganda and aggregates output from approximately 40,000 smallholder farmers.

The National Rural Support Programme (NRSP) is an agriculture-focused microfinance bank in Pakistan that specializes in providing working capital microloans to smallholder farmers for purchase of key farming inputs. NRSP is an Acumen investee.

Western Seed produces high-yielding hybrid seeds in Kenya, with a specialty in maize. The company provides a range of seeds designed for varying altitudes, ecological zones and crop life cycles. Western Seed is an Acumen investee.

7 Based on data from United Nations Department of Economic and Social Affairs, Population Division, 2014 Revision of the World Urbanization Prospects and CIA *World Factbook* entries for India, Pakistan, Uganda, Kenya, and Ghana.

8 Fairtrade Foundation, *Powering Up Smallholder Farmers to Make Food Fair: A Five Point Agenda*, London: Fairtrade Foundation, 2013. World Cocoa Foundation, *Cocoa Market Update 2012*. http://worldcocoafoundation.org/wp-content/uploads/Cocoa-Market-Update-as-of-3.20.2012.pdf.

9 Food and Agriculture Organization of the United Nations, FAOSTAT, http://faostat.fao.org/.

10 International Fertilizer Development Center, "Improving Fertilizer Supplies in sub-Saharan Africa," *IFDC Report* 37, no. 2 (2012).

11 Jamil Ahmad, Dastgir Alam, and Shaukat Haseen, "Impact of Climate Change on Agriculture and Food Security in India," *International Journal of Agriculture, Environment and Biotechnology* 4, no. 2 (2011): 129–37.

12 Mark W. Rosegrant, Jawoo Koo, Nicola Cenacchi, et al., *Food Security in a World of Natural Resource Scarcity: The Role of Agricultural Technologies*, Washington, DC: International Food Policy Research Institute, 2014.

13 Nikos Alexandratos and Jelle Bruinsma, "World Agriculture Towards 2030/2050: The 2012 Revision," Food and Agricultural Organization of the United Nations, http://www.fao.org/docrep/016/ap106e/ap106e.pdf.

14 See Harvey Koh, Nidhi Hegde, and Ashish Karamchandani, *Beyond the Pioneer: Getting Inclusive Industries to Scale*, Mumbai: Deloitte Touche Tohmatsu India Private Limited, 2014.

Photo credit: One Acre Fund

Farmer profile: Pamela

An early One Acre Fund farmer

Pamela* owns several acres of land in western Kenya and grows almost a dozen crops, including maize, chilies, sorghum and sugar cane, which she rotates regularly. She shares her home with her husband and children. Pamela was trained as a teacher before she began farming and raising her family.

Pamela used to buy seeds from agricultural retail stores, or "agrovets." The seeds were inexpensive but of low quality. Sometimes the seeds would contain seed rot; often, the seeds did not produce the expected yields. In addition, these retailers required upfront cash payment. Pamela's purchasing ability was greatest right after she had sold her harvest. However, this money would often already be spent by the time she needed to buy inputs for the next growing season.

Pamela heard about OAF in 2010: "A field officer came and pitched the idea to me in 2010. She said that we will teach you how to plant better and our inputs will improve your yield." Although OAF's inputs were more expensive than those offered at the agrovets, Pamela joined OAF because she could buy the inputs on credit and repay the loan on her own schedule, based on what she has week to week. She receives the seeds and fertilizer at a location in Kibochi, a few kilometers from her farm.

According to Pamela, "The One Acre Fund seeds have never failed, and they are always there when I need them before planting. I've personally convinced five neighbors to join the program." Pamela finds that the seeds perform as promised and are delivered at the right time for the planting season, and she has access to the financing she needs to be able to purchase them.

** Full name and select personal details have been disguised*

2.

Why farmers adopt: A focus on the Four A's

This chapter outlines findings from the primary research we conducted to understand the farmer from the perspective of the pioneer firm. We interviewed more than 320 smallholder farmers across four countries in South Asia and sub-Saharan Africa, with the aim of identifying the common factors that promote farmers' adoption of an innovation. These conversations informed the articulation of the Four A's as the main drivers for smallholder adoption of agricultural innovations. We describe each in detail and discuss how farmers experience them.

"I drove a motorcycle more than 100 km in order to buy a micro-drip irrigation system."

— Smallholder farmer in Karnataka, India

Why farmers adopt: A focus on the Four A's

Much has been written about smallholder farmer behavior and what drives farmer adoption of innovations. However, much of this writing is narrowly focused (on one crop or one technology in a certain region) or lacks specific business implications to inform management decisions.

In this chapter, we dive into the Four A's, a simple and practical model that helps the leaders of pioneer firms understand the drivers of adoption. We have built this framework from a review of existing scholarship, interviews with more than 320 smallholder farmers in Kenya, Ghana, Uganda and India, and discussions with dozens of sector experts and frontline employees at pioneer firms.

Our hope is that this framework is simple and intuitive enough to be easily grasped and powerful enough to drive strategic decisions for organizations aiming to profitably serve large numbers of smallholder farmers.

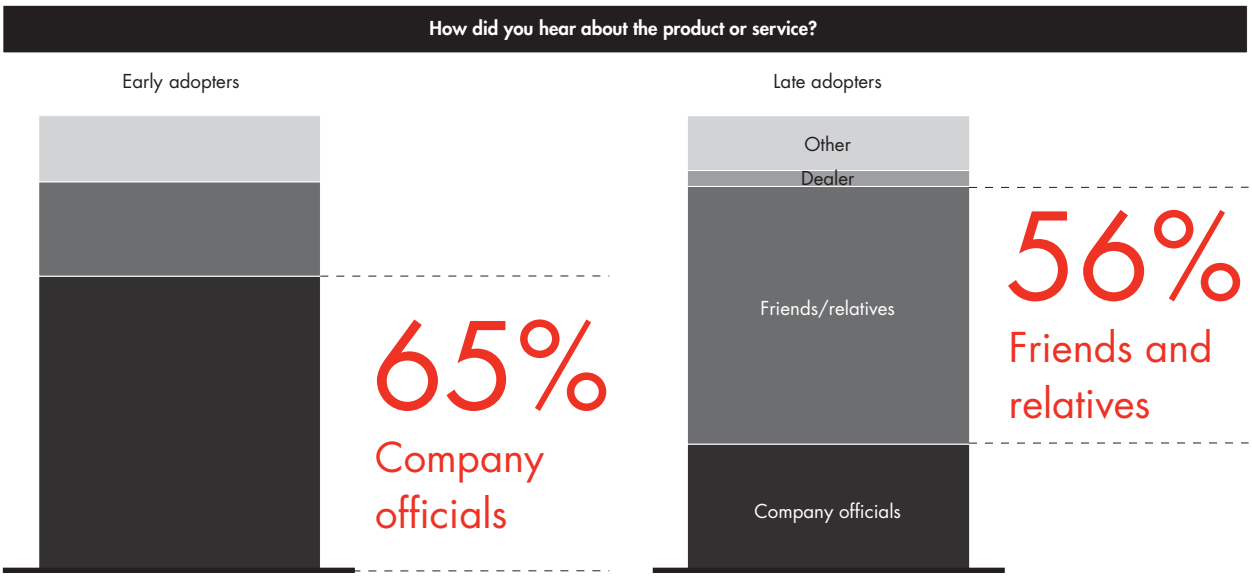
This chapter details each of the Four A's, analyzing how farmers experience them. As with any framework, it serves as a guiding construct that must also take local contexts into consideration: The Four A's are experienced differently from country to country, from crop to crop and from farmer to farmer.[15]

For an agricultural product or service to be widely and sustainably adopted, all Four A's must be in place.

Awareness: "Do I know about the product or service, and what have I heard about it?"

Achieving awareness is particularly challenging in the rural context. Many farmers have limited access to mass media, so they don't see advertising about innovations. Therefore, awareness must often be built through face-to-face interactions. We found in our interviews that

Figure 3: Company officials are the primary influencers of early adoption; influence of friends or relatives grows over time



Note: Early adopters are those who used the product or service within the first year it was made available to them; "other" includes radio, newspapers, government officials and third-party nongovernmental organizations.
Source: Bain smallholder farmer primary research

About our smallholder farmer survey

In developing this paper, we bring to bear the best of Bain & Company and Acumen. Bain has decades of experience helping private-sector companies achieve profitable growth, and we have tailored the concepts we use with large corporations to the context of agriculture-focused pioneer firms operating in developing countries.

To do this, we have benefited from Acumen's extensive experience investing in and supporting pioneer firms serving low-income customers across the developing world and from its thoughtful synthesis of lessons learned to share with a broader audience. Together, we conducted a four-month study in South Asia (India and Pakistan) and sub-Saharan Africa (Ghana, Kenya and Uganda); our primary research with farmers was enhanced by interviews with management teams and frontline employees at 11 pioneer firms (both Acumen agriculture investees as well as other agricultural enterprises) providing a range of products or services to smallholder farmers. Finally, we drew on the advice and perspectives generously provided by a diverse group of more than 60 external experts from development organizations, corporations, universities, NGOs, investment funds and advisory firms to understand their perspectives on farmer adoption.

Our goal was to understand why a farmer had or had not adopted a particular product or service and how wider factors, such as local environment, educational background and level of poverty, informed the decision. The farmer communities where we conducted our interviews were selected to ensure there would be a sufficient mix of different types of adopters: "early" adopters, who tried the product or service within the first year of its introduction to their community; "late" adopters, who adopted the product or service after it had been available for more than one year; "non-adopters," who never tried the product or service; and "discontinuers," who tried the product or service but no longer used it.[16] The characteristics of these farmers are as follows:

- 30% were early adopters, 45% were late adopters, 20% were non-adopters and 5% were discontinuers
- More than 75% owned five acres of land or less and owned fewer than five head of cattle
- One-half had less than a secondary-level education
- Interviewees were roughly equally distributed across four age groups: 21 to 30 years, 31 to 40 years, 41 to 50 years and 51 years and older

More than 70% of these farmers were men, owing, in part, to our stated desire to speak to the primary decision maker who determined whether the family should adopt a product or service and, in part, to the patriarchal structure of the societies in the areas included in our study.

Our survey questionnaire was designed to uncover how farmers came to learn about a particular innovation, from whom they heard about the product, where they first saw it, where they purchased it, how they bought it (cash or credit), what they thought it would do and whether the expected results were achieved. The

(Continued)

Four A's framework emerged from these conversations through analysis of their common answers, as well as from our literature review and discussions with experts in the field.

To determine the level of poverty in our sample, we used the Progress Out of Poverty Index (PPI): "[A] poverty measurement tool for organizations and businesses with a mission to serve the poor. The PPI is statistically sound yet simple to use: the answers to 10 questions about a household's characteristics and asset ownership are scored to compute the likelihood that the household is living below the poverty line—or above by only a narrow margin. With the PPI, organizations can identify the clients, customers, or employees who are most likely to be poor or vulnerable to poverty, integrating objective poverty data into their assessments and strategic decision making."[17] Based on these questions, approximately three-fifths of our sample are living below the $2.50-per-person-per-day poverty line (based on 2005 purchasing-power parity-adjusted prices).[18]

This was consistent with other aspects of our findings, given that one prerequisite for a farmer's investment in, and adoption of, an agricultural innovation is the belief that it will increase his or her income. This mindset is not to be underestimated in its importance to motivating adoption. Along these lines, the Syngenta Foundation has created a helpful segmentation of farmers into groups based on their level and sophistication of agricultural input adoption.[19] Based on this categorization, most farmers we interviewed were either emerging from being subsistence farmers (unable to sell much of their output and needing to master the basics of soil and water management and use of manure) to being semi-commercial farmers (usually able to produce sufficient excess production to sell for income and using some level of hybrid seeds and synthetic fertilizer).

Our principal aim is not to provide new research on farmers themselves, given that there is already a wealth of research on this topic. Instead, we are focusing more specifically on ways of interpreting farmer behavior that are most useful for pioneer firms' decision making.

early on in the process of introducing a product or service, farmers most often hear about an innovation from salespeople who go into the community, where they talk directly to farmers and conduct product demonstrations. Later in the adoption cycle, friends and family members increasingly spread awareness throughout their communities. In our study, about 65% of early adopters (those who first adopted a product or service within a year of its availability to them) heard about a product or service from a company official. This is the case for only 28% of late adopters, most of whom (56%) get their initial information from friends and relatives (*see Figure 3*).

Farmers are more likely to consider an innovation when they trust the company and its personnel. As one farmer told us, "I do not take a company seriously until its people have come to my village at least three times." Trust also helps to combat skepticism among farmers who may have experienced broken promises regarding the products they have received or purchased in the past from governments, NGOs or private enterprises. This trust-building

"Promoters" are especially important for spreading and sustaining awareness, so it is important that early adopters have a positive experience with the product or service.

prerequisite is the reason why selling to this segment is so time intensive and, hence, costly. Marketing new products and services requires high engagement with geographically dispersed farmer customers, thereby calling for both focus and patience from the company and its backers.

In the absence of traditional media, "promoters" are especially important for spreading and sustaining awareness. It is simply too hard and costly for firms to directly reach all their potential rural customers in the "high-engagement" manner described. This makes it all the more important to ensure that early adopters have a positive experience with the product or service. These promoters can then help spread the word about the product or service among those who have not yet adopted it. Conversely, if early adopters have a negative experience, they will warn others not to try a product or service. Over time, these influencers become the most important source of information about a product or service.

Based on our research, these crucial early adopters tended to be wealthier (*see Figure 4*). Though this observation is based on a limited data set, it makes sense that those with greater financial resources are in a better position to take greater risks or purchase products from savings; they also often have greater access to transportation, which helps to overcome obstacles to procuring the product or service. In addition, those with more wealth may be better educated and, therefore, better placed to understand the potential advantage that a product or service could provide. This data suggests that firms can be more deliberate in considering who their early adopters might be and can target their awareness-building efforts accordingly.

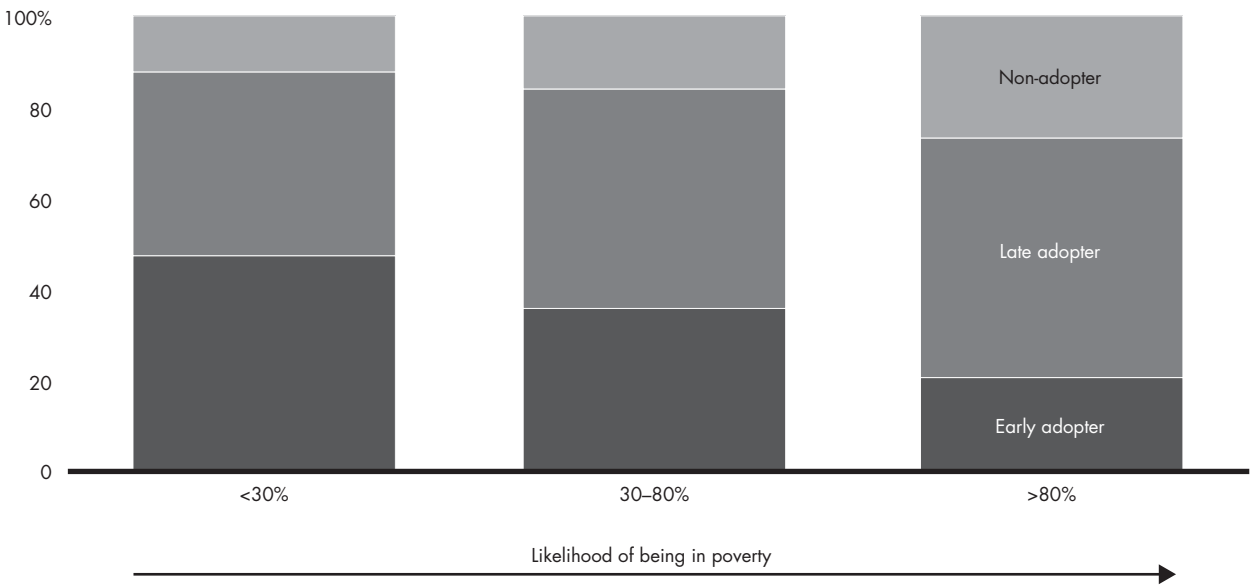
Other research has similarly emphasized the importance of social networks. For example, the recent Hystra report *Marketing Innovative Devices for the Base of the Pyramid* found, "A large percentage of [base of the pyramid] customers make a purchasing decision based on what their neighbors and relatives recommend to them: 92% for solar home systems, 60% for home improvement packages, 60% for improved cook stoves and 49% for irrigation pumps."[20]

Advantage: "How much more benefit will I gain from this product or service relative to what I'm currently doing?"

Although advantage, in general, is paramount, the *type* of advantage also matters significantly. Our research indicates that the extent to which a product is seen to increase financial standing is the most powerful driver of adoption of an agricultural innovation. More than 60% of the farmer responses were related to how a product or service would increase wealth (*see Figure 5*).[21] Farmers cited other considerations, such as mitigated risks or better service, less frequently as primary drivers of adoption. This means that firms targeting this segment must have a very clear and compelling explanation for how their product or service will directly increase customers' income, ideally in the very short term.

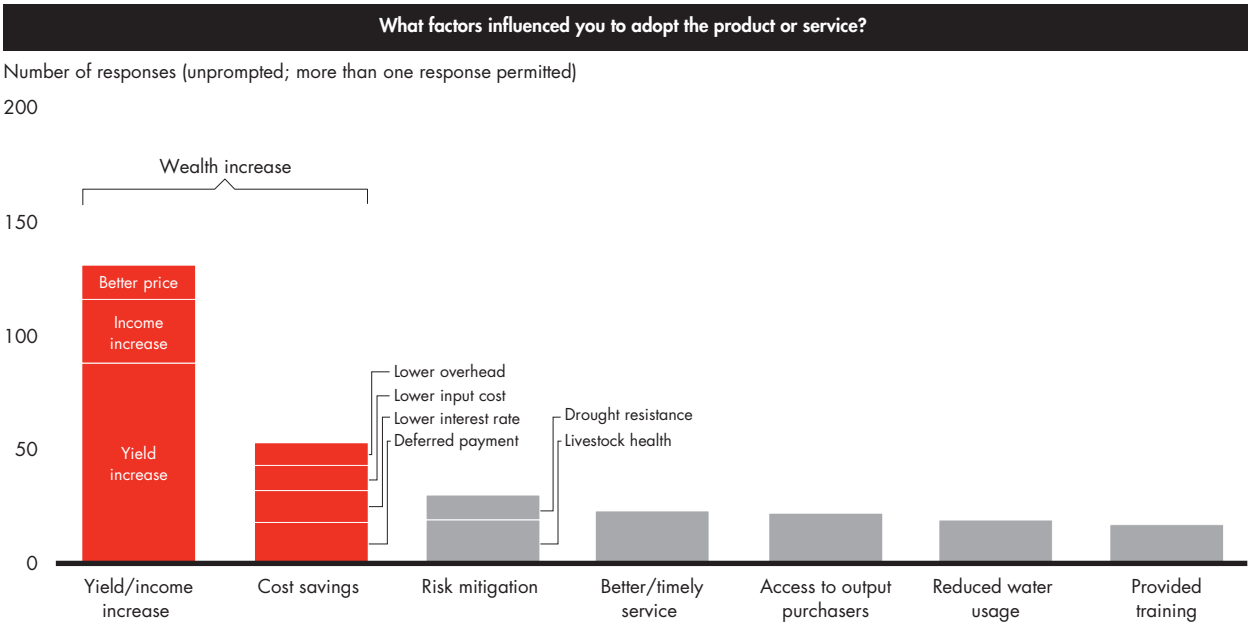
Not surprisingly, we found that the value placed on increased wealth was related to the level of poverty: Farmers in our sample who had an 80% or greater chance of being in poverty were more likely to mention wealth increase as influencing adoption of a product or service (*see Figure 6*).

Figure 4: Wealthier farmers are more likely to experiment and adopt innovations



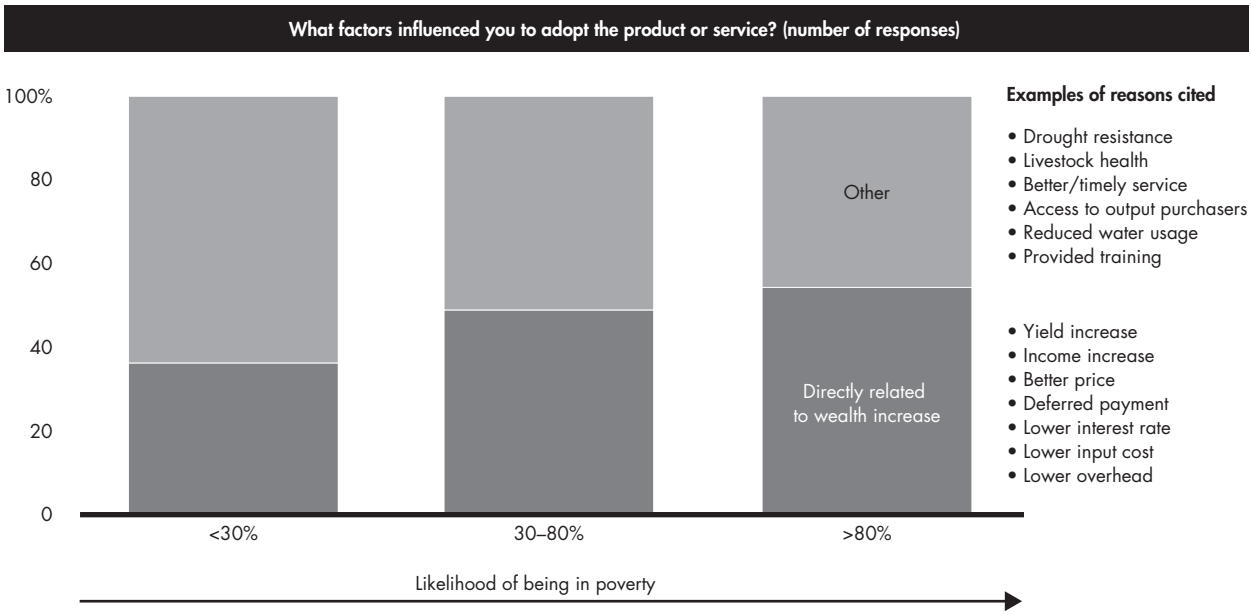
Note: Early adopters are those who used the product or service within the first year it was made available to them; the 2005 Purchasing Power Parity (PPP)-adjusted $2.50-per-day scale was used to calculate the Progress out of Poverty Index.
Source: Bain smallholder farmer primary research

Figure 5: Wealth increase is the most frequently cited reason for adoption



Source: Bain smallholder farmer primary research

Figure 6: Factors directly affecting wealth increase are relatively more important to farmers who are more likely to be in poverty



Note: The 2005 Purchasing Power Parity (PPP)-adjusted $2.50-per-day scale was used to calculate the Progress out of Poverty Index.
Source: Bain smallholder farmer primary research

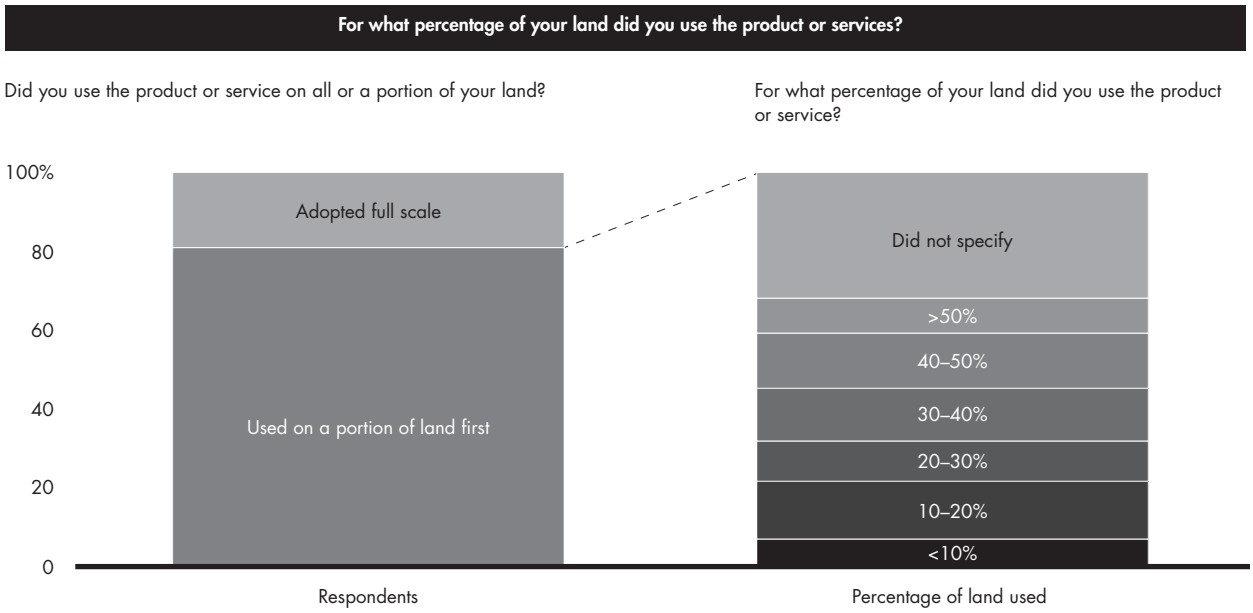
Experiencing the advantage through trying the product or service is crucial to sustained adoption. Eighty percent of the farmers we surveyed "trialed" a product or service, and of those, the vast majority bought enough for only one-half or less of their land (*see Figure 7*). This was true regardless of how much acreage they had, how wealthy they were and whether they were early or late adopters. With long feedback loops between usage and advantage, trialing can encourage farmers to adopt without having to risk their entire future harvest.

Affordability: "Do I have enough money at the right time to buy it?"

Smaller, incremental product or service sizes increase affordability. Farmers perceive affordability both in terms of the value a purchase can generate and the absolute cash outlays required. Allowing farmers to make small, incremental purchases directly addresses their cash outlay constraints while enabling them to test a product or service.

Access to financing can help farmers avoid the burden of making a large, lump-sum payment to purchase a product or service. Because their cash flows tend to be irregular, smallholder farmers value access to finance

Figure 7: Most farmers trialed the product or service to observe the advantage directly



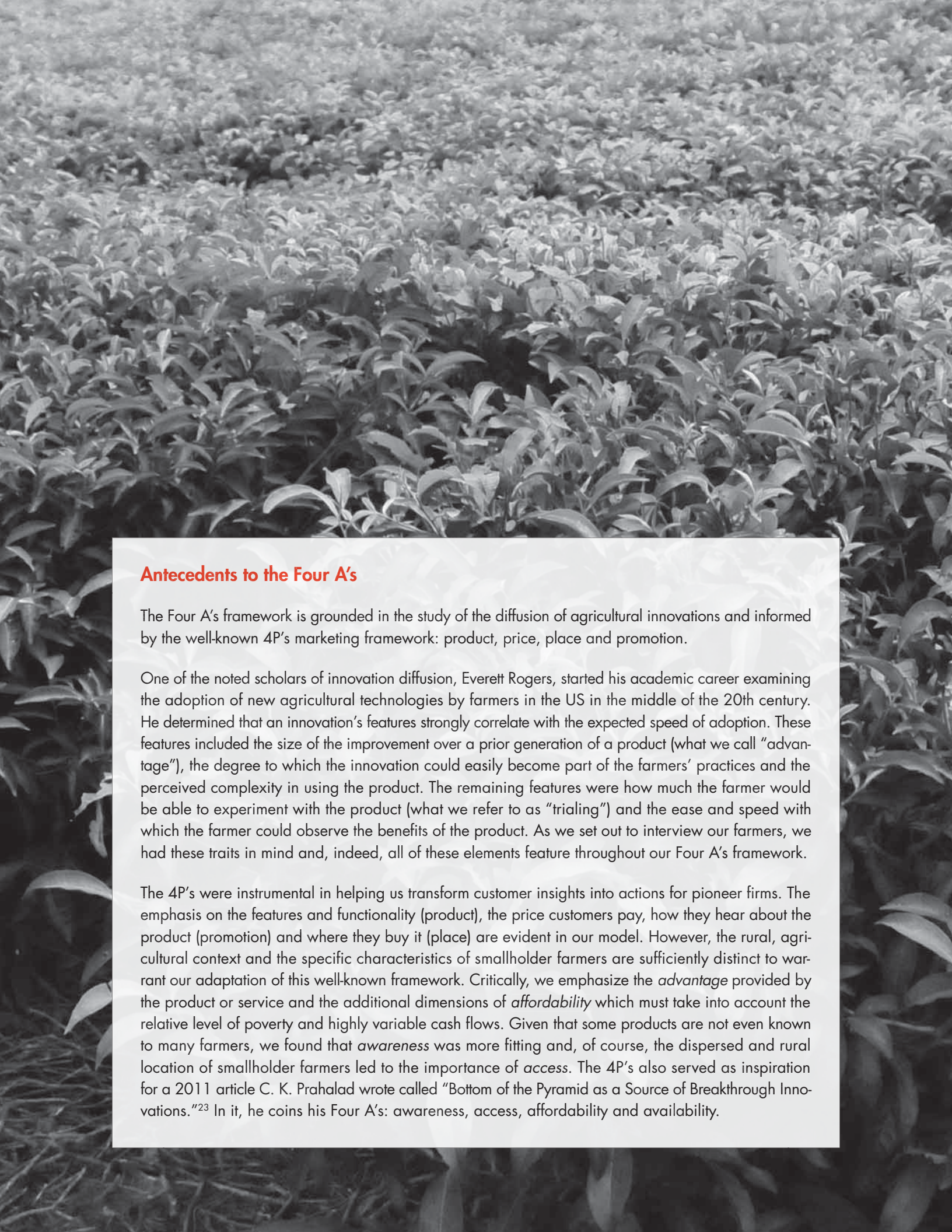
Note: Excluded One Acre Fund and Juhudi Kilimo, as product cannot be trialed.
Source: Bain smallholder farmer primary research

and flexibility in paying back loans. Almost one-third of the respondents to our survey who cited cost savings as the primary reason for their adoption of a product or service emphasized the importance of deferred payment. For example, many of the farmers we interviewed in Kenya readily pay 20% more for the OAF inputs package vs. what they would pay at a local store, because of the deferred payment scheme that the organization offers.

A product or service also has to be affordable at the right time. Because farmers' cash flows align with harvesting cycles throughout the year, the timing of the purchase is almost as important as the absolute price. A new product or service feels much more affordable immediately after harvest, when farmers have either sold their surplus output and have cash on hand, or they have secured enough food for their families and, therefore, feel safer dipping into savings to purchase an innovation. Firms need to understand and map the cash-flow cycles of their target customers across the year based on what individual farmers are growing. An Acumen investee from an adjacent sector provides a good example: d.light, which produces and sells solar lights. They have had great success selling their products to farmers at local markets, literally within minutes of the farmers' greatest spike in income after having sold their harvest.[22]

Access: "Can I get it easily when I need it?"

Whereas much has been made of the importance of last-mile distribution, our findings on this point were mixed. Without a doubt, devising a distribution and logistics capability to reach customers is crucial. However, among the farmers we spoke to, many reported that they had traveled considerable distances to reach formal retail outlets and purchase inputs. For example, Sidai, a formal retail outlet for veterinary services and agriculture inputs, has been able to sustain and grow its business by mostly selling to farmers who are willing and able to travel into small towns to purchase products and services.



Antecedents to the Four A's

The Four A's framework is grounded in the study of the diffusion of agricultural innovations and informed by the well-known 4P's marketing framework: product, price, place and promotion.

One of the noted scholars of innovation diffusion, Everett Rogers, started his academic career examining the adoption of new agricultural technologies by farmers in the US in the middle of the 20th century. He determined that an innovation's features strongly correlate with the expected speed of adoption. These features included the size of the improvement over a prior generation of a product (what we call "advantage"), the degree to which the innovation could easily become part of the farmers' practices and the perceived complexity in using the product. The remaining features were how much the farmer would be able to experiment with the product (what we refer to as "trialing") and the ease and speed with which the farmer could observe the benefits of the product. As we set out to interview our farmers, we had these traits in mind and, indeed, all of these elements feature throughout our Four A's framework.

The 4P's were instrumental in helping us transform customer insights into actions for pioneer firms. The emphasis on the features and functionality (product), the price customers pay, how they hear about the product (promotion) and where they buy it (place) are evident in our model. However, the rural, agricultural context and the specific characteristics of smallholder farmers are sufficiently distinct to warrant our adaptation of this well-known framework. Critically, we emphasize the *advantage* provided by the product or service and the additional dimensions of *affordability* which must take into account the relative level of poverty and highly variable cash flows. Given that some products are not even known to many farmers, we found that *awareness* was more fitting and, of course, the dispersed and rural location of smallholder farmers led to the importance of *access*. The 4P's also served as inspiration for a 2011 article C. K. Prahalad wrote called "Bottom of the Pyramid as a Source of Breakthrough Innovations."[23] In it, he coins his Four A's: awareness, access, affordability and availability.

Whether farmers perceive an agricultural innovation as accessible depends on their mobility constraints. For example, many of the farmers we spoke with in India are men who own motorcycles they can drive to the nearest store. They are willing and able to travel over longer distances to purchase a product or service. By contrast, many farmers we met with in Kenya are women who have no motorized transport. They must travel on foot, so agricultural innovations need to be located close by to be accessible for them.

A product or service must be available when it is needed. If seeds that must be planted before the rainy season arrive in a retail store one week after the rains or if semen for artificial insemination arrives after breeding animals are no longer in heat, the products are of no use to farmers even if they are brought to their doorstep. OAF considers access to be so critical that it insists on delivering its products to farmers on the day they need them to locations within walking distance.

Advantage carries the most weight of all the A's

None of the Four A's alone is sufficient to drive adoption of an innovation. However, if farmers do not consistently perceive that a product or service offers benefits beyond their current practices, they will not adopt it. Conversely, if the advantage conferred by an innovation is sufficiently large, adopters will be more willing to overcome the other key barriers of affordability—often saving cash or borrowing money to pay for the product—and access. For example, in the case of a number of farmers we spoke to in the drought-ravaged areas of Karnataka in India, many said they had taken loans at very high interest rates or driven more than 100 kilometers to secure the microdrip irrigation product that could mean the difference between having a crop or not.

15 Although advantage, affordability, awareness and access all strongly affect smallholder farmers' willingness and ability to embrace and continue using agricultural innovations, other drivers of farmer behavior in general, such as sex, prior experience and sense of self (the way they view farming as either a profession or a necessity),will influence the adoption process. Such determinants may override other considerations for certain consumer segments. For example, marginalized farmers, such as women in a patriarchal society or landless persons who have little decision-making power, may feel that they are not capable of using or using correctly a particular technology, product or service. The Four A's are still relevant for these segments, but are incomplete without the broader contextual understanding.

16 To ensure we had a sufficient mix of different types of farmers, we were assisted in identifying the villages in which we conducted our research by the pioneer firms. Though we note this as a possible source of bias, we feel the benefit of support from companies in identifying a good mix of interviewers outweighed this risk.

17 See Progress Out of Poverty, "About the PPI: A Poverty Measurement Tool," Progress Out of Poverty's website, www.progressoutofpoverty.org/about-ppi.

18 Data on poverty levels in India and Kenya, accounting for 80% of the sample, were significant to 95%. Data from Ghana were significant to 80%; data from Uganda were not significant.

19 Yuan Zhan, *Smallholder Agriculture, Sustainability and the Syngenta Foundation*, Basel: Syngenta Foundation, 2010.

20 Hystra, *Marketing Innovative Devices for the Base of the Pyramid*, Paris: Hystra, 2013.

21 Factors included yield increase, income increase, price increase for outputs, lower costs, deferred payments and reduced use of other inputs.

22 This example also highlights how multiples of the Four A's incentives work in concert; in this case, affordability and access together drive a potential sale.

23 C. K. Prahalad, "Bottom of the Pyramid as a Source of Breakthrough Innovations," *Journal of Product Innovation Management* 29, no. 1 (2011): 6–12.

Farmer profile: Cynthia

A late adopter of Juhudi Kilimo's asset-backed microfinance

Cynthia* lives on a one acre farm near Eldoret, Kenya. She has six people in her family and grows maize and vegetables on her land.

Like many in Western Kenya, she wanted to own a cow for the milk it would produce for her family to consume. As she walked through her small village in December 2012, she noticed a neighbor's cow looking particularly healthy. She asked her neighbor where she had purchased it and how she was caring for it. The neighbor said that she bought the cow with the help of Juhudi Kilimo. "She explained that this company gave her a loan for the cow and that she was now repaying it using the money she got from selling some of the cow's milk to a local dairy," says Cynthia. Juhudi Kilimo had lower interest rates, which would make it easier for her to pay back the loan over time. "I wanted to understand how it worked, so I spoke to another four people in my village who had taken loans with Juhudi Kilimo," she says.

Given her family's finances and the need to focus on her acre of planted maize and vegetables, Cynthia did not follow up with Juhudi Kilimo until June 2013. "Other people who had taken loans were meeting on a regular basis to talk about repayment," she says, "and I saw them attending classes where they would learn about how to care for the cows better." Eventually, Cynthia attended one of these trainings and asked for a loan to buy her own cow. "I wanted to own a cow for the extra food it provided my family and because I wanted to sell what milk we didn't consume to make some additional income."

Cynthia formed a group of five women who would support each other's loans. Given the company was already operating in her community, she didn't have to travel far to receive her loan. She bought her cow from another farmer only two kilometers from her home.

"The cow produces four liters of milk a day, and we consume two of them," she says. "I sell the other two to another farmer with a motorcycle who takes the milk to a local dairy. I am planning to take another loan from Juhudi Kilimo to purchase another cow and buy a small plot of additional land."

** Full name and select personal details have been disguised*

3.

Promoting adoption: Challenges and opportunities

This chapter addresses the Four A's from the perspective of the pioneer firm, offering concrete examples of how firms are ensuring each driver is in place. Though the framework may seem familiar to some, we believe there is great value in the detailed review of the instances of ingenuity shown as particular pioneer firms have harnessed these drivers to overcome the unique obstacles inherent in developing-market agriculture to deliver value to smallholder farmers.

"The typical pictures of poverty mask the fact that the very poor represent resilient entrepreneurs and value-conscious consumers."

—C. K. Prahalad

Promoting adoption: Challenges and opportunities

Pioneer firms that introduce an agricultural innovation face a number of challenges that can impede both the rate and the scale of adoption.

A challenging customer segment. Smallholder farmers have low purchasing power often linked to crop or livestock cycles. As a result, pioneer firms find it difficult to acquire a critical mass of early adopters who have both the inclination to consider an innovation and the disposable income to pay for it. Even when there are farmers willing to try the innovation, most do so in increments, hedging against failure by testing the innovation on only part of their land. They watch how it performs over a full crop or breeding cycle before fully adopting it, creating a time lag before a significant share of spending has been amassed among even the earliest adopters.

Pockets of applicability. The advantages conferred by agricultural innovations are highly dependent on ecological conditions. In contrast, the benefits of solar lights or clean cook stoves are manifested quickly and, by and large, consistently. Microfinance has been successful because of the applicability of credit for the poor: Affordable, timely credit (at 30% annual interest) provides a huge advantage over a local moneylender (at 120% annual interest) or over having no access at all to capital. In contrast, an agricultural product or service will perform differently in different environments. Finding these pockets of applicability takes time as a company comes to understand the impact of ecological conditions on performance.

Disconnected markets. Even when a new product is well adapted to local conditions, its spread across wide areas can be complicated by farmers' geographic dispersion and by varying levels of infrastructure—both roads and forms of communication—in rural areas. Often, the quality of agricultural storage and processing and the access to agri-inputs, extension services, financing and markets vary from village to village and region to region. All of these influence the benefits to a farmer from a given product or service. Innovation adoption will likely be slower in areas recovering from recent political conflicts—areas that have experienced significant dislocations, broken family hierarchies and decimated productive capacity.

Immature business models. Given the small number of sizable, successful pioneer firms working with smallholder farmers, there is a dearth of proven models for founders to emulate. These new businesses often lack the strategies, processes, talent, systems and metrics to efficiently and effectively manage the growth of their firms. Growing a pioneer firm requires a series of iterations of its business model that make a company's journey to scale anything but linear. As Vijay Mahajan, founder and CEO of the BASIX group of companies in India, says, "As you grow and learn as an organization, you move up and down the curve, you loop back and forth, and jump from one place to another as you figure out what works."

Figure 8: GEWP targeted farmers based on factors most conducive to drip irrigation success

Factor	More likely to succeed	Less likely to succeed
Type of crop	Commercial crops (vegetables, cotton, etc.)	Cereal crops (paddy, millet, wheat, etc.)
Crop cycle	Short	Long
Crop spacing	1–3 feet	Dense or >5 feet
Plot terrain	Flat	Uneven, sloping
Plot size	<5 acres	>5 acres
Water requirement	Regular	Irregular
Access to water	Bore well	Rain

Microdrip irrigation is most effective for commercial crops cultivated on flat plot <5 acres with access to a defined water source

Source: Interviews with GEWP management

It is because of these challenges that the Four A's serve as a powerful unifying framework for addressing target customers' needs. To understand the successes and challenges of addressing these structural barriers to adoption of innovations by smallholder farmers, we looked across the case-study companies to understand how each "A" has been addressed and to pinpoint what worked, what didn't and why.

As in any other business context, the maxim "know thy customer" lies at the heart of promoting the adoption of agricultural innovations. No matter how game changing an innovation may be, entrepreneurs leading pioneer firms must have a deep understanding of, and commitment to, smallholder farmers to encourage the sustained adoption of their product or service. Through a relentless process of trial and error, leading pioneer firms have identified ways to persuade farmers to purchase their innovations season after season, despite variability in rainfall and other conditions. Understanding the importance of creating lasting bonds of trust with their customers, entrepreneurs become closer to smallholder farmers through direct and continuous contact. The most successful entrepreneurs understand not only how farmers live and work but also what they value, hope for and fear.

Entrepreneurs who invest time in achieving a nuanced understanding of smallholder farmers will reap significant rewards: The Four A's will be transformed from obstacles to drivers of adoption.

Why farmers adopt: The Four A's of adoption

Awareness

Before farmers adopt or test an innovation, they need to know about it and be motivated to test it on their land. How new customers learn about a product or service necessarily evolves as a firm grows. As illustrated by our primary research, early awareness is commonly generated by the company through its marketing efforts in farmer communities. As a product or service gains traction, farmer-to-farmer interactions become more potent

A company's journey to scale is anything but linear

sources of awareness. Firms become more effective as they grow by maintaining a strong presence in communities and systematically harnessing the power of loyal customers, who become the best advocates for the company.

Strategically target early adopters to maximize the "demonstration effect" and observability. To identify the archetype of a successful early adopter, a firm needs to determine both the environmental and farmer characteristics that best align with the product or service the firm is selling. Farmers with higher levels of income and social status, prior experience adopting innovations and access to media are generally more receptive to adopting new products or services.[24] However, pioneer firms should look beyond demographic factors to target their best early-adopting customers. For example, GEWP determined that its microdrip irrigation system would be most effective for commercial crops like tomatoes, pomegranates and cotton, cultivated on a flat plot of less than five acres and having access to a well, so they targeted customers with these characteristics as their earliest adopters (*see Figure 8*).

Similarly, Juhudi Kilimo uses a well-defined self-selection process to target farmers who are most likely to succeed in using asset-backed loans to increase productivity and income. The customers have to own their land (to reduce the likelihood of leaving the community without having repaid the loan), be willing to work in groups and attend weekly meetings and be able to save 15% of the loan amount. In addition to these process screens, the Juhudi Kilimo staff looks for farmers who are already interested in borrowing to purchase a productive asset (usually a cow) and who demonstrate the ability to manage that asset to make it productive. Collectively, these considerations provide a clear indication of a farmer's inherent motivation and self-discipline. They also allow the company to assess the farmer's level of commitment and loan repayment ability.

Finally, pioneer firms need to focus their awareness efforts on farmers whose success will have the greatest "demonstration effect." They need to ask the question: Will this farmer's successful use of the innovation be readily observable by his or her neighbors and spur broader adoption? As one farmer told us, "I will not risk using a new product for my crop before I can observe its benefits on someone else's fields." When piloting its microdrip irrigation system, GEWP selected farmers with vegetable plots (which have shorter cycles) located next to roads so that other farmers could readily observe the system's performance. In northern Uganda, GADC made sure that its demonstration plots for organic cotton were near churches where farmers would gather every Sunday for services. Demonstration plots are especially valuable for firms whose salesforce will not be continuously present in a particular community for an extended

time. In effect, readily observable benefits do some of the work of persuading the broader community to adopt.

Ensure success of early adopters through dissemination of technical knowledge. The advantage conferred by a new product or service is often realized only if farmers have specific, detailed guidance on how to use it. A farmer may not necessarily know, for example, that a new seed must be planted after three consecutive days of rainfall, in rows 6 inches deep and 18 inches apart. If the company doesn't build this type of education and reinforcement into its sales process, early adopters will not experience the advantage that the innovation offers.

Widely disseminate success stories tailored to target customers. Early adopters' success stories are the most powerful tool to spur broader adoption by other farmers. A well-designed market activation strategy applies tailored outreach methods that range from village-level demonstrations to broadcast media. For example, Juhudi Kilimo purchases time for radio broadcasts on local stations to raise awareness of success stories. During hour-long broadcasts, a Juhudi Kilimo business development officer interviews a customer who is local or from a nearby region and who has significantly benefited from Juhudi Kilimo's services. Similarly, GEWP used many different methods, from painting billboards to showing Bollywood-style films, to explain the virtues of using micro-drip irrigation.

Amplify word-of-mouth effect by leveraging customer advocates ("promoters"). Bain's research has established a strong link between customer advocacy and profitable, sustained growth.[25] As pioneer firms seek to drive adoption across a broader, dispersed base of customers, they should use "promoters"— customers who recommend that their friends and relatives purchase a product—as an important, cost-effective resource. Juhudi Kilimo determined that word-of-mouth referrals by friends and relatives were by far the most common way farmers heard about its lending services. In fact, according to Juhudi Kilimo's CEO, Nat Robinson, up to 60% of its customers come through referrals (the proportion was even higher in our survey sample of Juhudi Kilimo customers). To actively promote referrals, the firm requires its existing customers to bring five other farmers with them when they attend training sessions.

Sustain brand presence to maintain and enhance customer relationships and trust. Pioneer firms that fail to maintain "share of voice" over time run the risk of losing their existing customers, capturing a smaller share of new customers or both. This can mean that a successful first mover loses market leadership as competitive offerings enter the market, especially for products or services with low barriers to entry. GEWP experienced just this. After an initial flurry of marketing activity, the company's salesforce did not revisit many communities

on a regular basis. As a result, farmers were more likely to switch to another provider or stop using the product altogether.

There is an understandable split between product and service companies in this regard. Product companies often spend a lot of time initially in communities to build demand but, like GEWP, may then move on to new areas. Conversely, service companies often need to maintain a continual presence in a community, as their models are built around regular customer interactions on a prolonged basis. NRSP and Juhudi Kilimo's microfinance model includes weekly or monthly meetings with customers for collections. As a Juhudi Kilimo business development officer explained: "Given distrust of microfinance institutions, we must maintain our presence and support farmers continuously in group meetings and training sessions. This effort also helps to build our brand." Eighty percent of the firm's customers we interviewed said they were satisfied with their level of interaction with company personnel. "Juhudi officers meet with me twice a month to provide training on animal husbandry and check on the group's progress. They are here whenever I need them," one farmer told us.

Successful product companies have ongoing marketing activities and periodic village visits to check in with customers and understand how well the product is working. This post-sales support and sustained customer interaction help build trust by showing farmers the company is invested in the long-term success of the community. This trust is a significant brand asset and becomes increasingly important as competitors' alternative offerings become available to the customer.

Awareness: Key questions to ask

- *To what extent do farmers know about your product or service category (e.g., microfinance, microdrip irrigation) and about your specific company offering?*
- *Which customers are most likely to be early adopters of your product or service innovation? What characteristics (e.g., demographic, behavioral, environmental) should guide your sales team's early-adopter customer targeting efforts?*
- *Is the accompanying information (e.g., planting techniques, installation) critical to your product's effective use always shared and well understood?*

- *What are the most effective communication channels to reach your target customers?*
- *How will you identify the "promoters" among your early-adopter customers and empower them to tell other prospective customers about your product or service?*
- *How will you sustain your presence in the communities in which you operate over time?*

Advantage

As discussed in Chapter 2, advantage is the most important of the Four A's for adoption: A farmer needs to perceive and experience the benefits provided by a new product or service to consider adopting it on a paid, sustained basis. Pioneer firms must concentrate their efforts on understanding farmers' unmet needs and identifying solutions to provide significant advantage.

Maximize advantage through a deep understanding of target customers' needs. GEWP started with a very clear understanding of the farmers' unmet needs. Across India, farmers largely rely on the monsoon to provide sufficient water for their crops. Even if farmers are lucky enough to have access to a well, they need to ensure the well has sufficient water at the right time of year. They also need to have sufficient money to purchase diesel fuel for generators that pump the water to their fields. Farmers often simply flood their fields to ensure plants receive water, wasting precious resources and encouraging the growth of weeds, which must be removed, usually by hand. Drip irrigation uses less water, and as the water falls directly on or very close to the specific plant stalk, significantly fewer weeds grow. However, drip irrigation was initially out of reach for the smallholder farmer. It was too costly and sold in packages better suited to larger, multiple-acre farms.

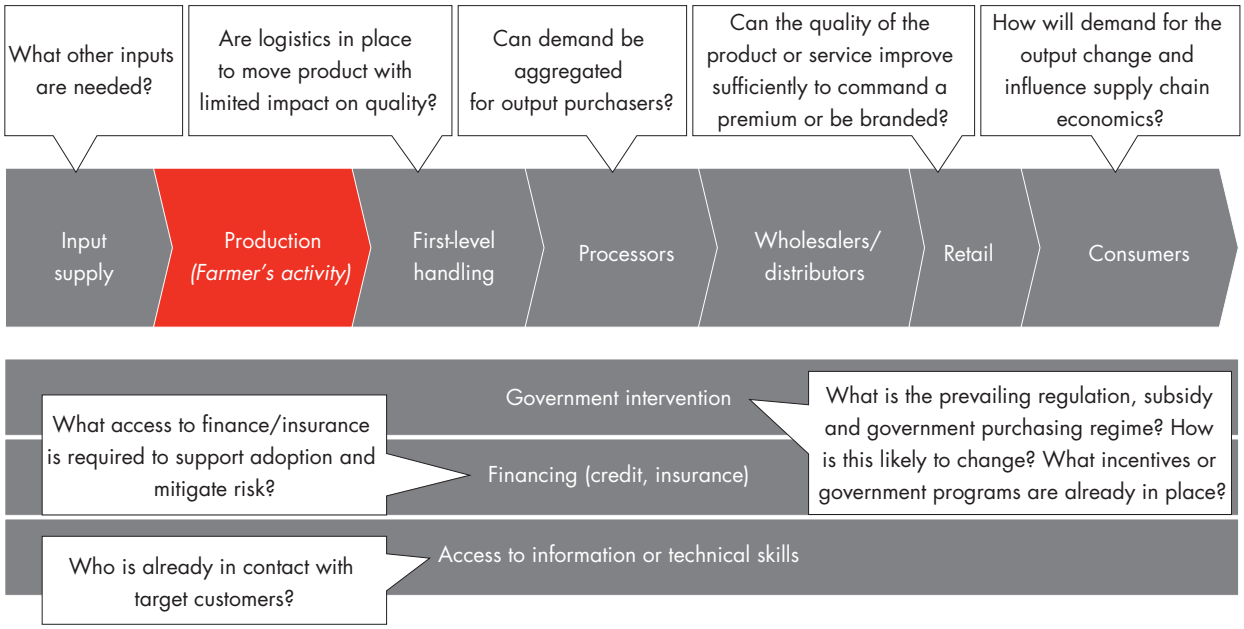
GEWP's drip irrigation kits address these problems. It should be noted that GEWP did not try to create a product for all farmers. The firm created a product that was well suited for smallholder farmers in Maharashtra, growing crops such as vegetables and fruit trees, for which drip irrigation works well. Furthermore, GEWP acknowledged that the product would work best on flat land, given that increased water pressure is required to move water up hills. Finally, the product was designed

to be used on a plot as small as one-quarter of an acre and robust enough to be moved and stored when not being used—important because many smallholder farmers own multiple small plots and rotate crops, some of which may not be suited for drip irrigation. Depending on crop type and local soil conditions, GEWP management has seen the use of KB Drip increase productivity by 20% to 90%. Reduced water consumption lowers irrigation costs because less money needs to be spent on diesel fuel to power a pump. Minimizing weeds further reduces costs, as does the reduced need for fertilizer, which can be delivered directly to the crop via irrigation pipes. The combination of increased yields and decreased costs results in direct, potentially significant, financial benefits for the farmer.

SV Agri provides another good example of how a deep understanding of farmer needs led to a robust design of the innovation. Its founder, Hemant Gaur, saw that while potato production in India was growing, increases in yield per hectare and farmer income were progressing more slowly, owing to the lack of quality planting material, modern farming practices and market linkages. Smallholder potato farmers typically replanted tubers (local varieties) whose productivity declined with each replanting. They generally lacked training and knowledge of modern agricultural practices, such as soil testing, pest management and fertilizer use. Finally, farmers often had to sell to middlemen or travel long distances to reach markets, which severely constrained their ability to increase actual income.

Gaur realized that a key underlying problem was the lack of easy access to an end buyer, so he designed an original business model for buying output from farmers directly and selling it to processors. However, customer feedback quickly revealed that farmers were not able to meet quality and yield requirements. The reason: the use of poor-quality inputs. As a result, SV Agri began to offer farmers not only high-quality planting material but also fertilizers and pesticides. SV Agri also allowed potato farmers to test its planting material on a small

Figure 9: The farmer is only one part of the system; other actors must be engaged to create an effective value chain



Source: Bain analysis

portion of their land to see the benefits before committing to a larger purchase. It was easy for farmers to use and evaluate SV Agri's planting materials because they could sow and prepare them in the same manner as they had previously. This high degree of compatibility with local practices meant that the firm did not need to provide extensive and costly training in new planting techniques. The firm also offered fixed or minimum prices for outputs to protect farmers from uncertain financial outcomes (although farmers are not compelled to sell to SV Agri exclusively). This understanding has translated into significant rewards for SV Agri's farmers. According to our research, SV Agri's farmers' productivity has increased by 30% to 40%, while costs have declined by 20% to 30%, resulting in an average income increase of 40%.

Identify value chain constraints and develop a plan to address these, including where partners are needed. This integrated value-chain perspective is required to ensure that the ultimate advantage of increased incomes for farmers can be reliably achieved. Many elements along the value chain of an agricultural output can obstruct a farmer's ability to transform inputs into actual income (*see Figure 9*).

To maximize advantage to its customers, SV Agri pursued a range of partnerships along the value chain, from planting-material development to end processing. The company obtains high-yielding varieties of tubers from a large multinational company and works with the Indian government's Central Potato Research Institute to multiply the tubers using aeroponic technology. It partners with local banks to provide financing for farmers by guaranteeing 10% of the loan amount. It also collaborates with Krüger & Salecker Maschinenbau GmbH & Company to manufacture processing equipment and provide support for processors.

The importance of understanding and influencing the value chain was also well understood by Acumen investee GADCO, an agri-food company that produces, processes and markets its Copa brand of long-grain rice in Ghana. Recognizing the need to improve yields and quality, based on the performance of its own 800-hectare nucleus farm, GADCO created a business model that would increase efficiency at its farm while also delivering increased earnings to smallholder farmers from whom GADCO purchases rice. The company intervenes directly in the value chain by distributing high-quality inputs to smallholder farmers on credit before the planting season, mitigating cash-flow constraints for the farmers at that time. The company purchases harvested rice, mills the rice and pays farmers a premium based on the quality of rice they are able to produce, which serves as an incentive for farmers to use better farming practices. Through its sponsorship of extension services, the firm provides farmers with information about farming methods and technical skills that enable them to realize higher yields.

For other segments of the value chain, GADCO has established partnerships to provide products and services it could not offer independently. Its partner, Syngenta, a Switzerland-based global agribusiness, provides seeds as well as inputs that protect crops. The World Bank has supported production by studying the financial and social impact of Copa Connect's pilot initiative and provides advice on business model refinements. GADCO's distribution partner, Ghana-based Finatrade Group, is responsible for the sales and marketing of Copa products.

Through these efforts across the value chain, GADCO and its partners have achieved significant impact. The yield of smallholder farms receiving support from GADCO is nearly twice the average for Ghanaian farms with irrigation (5.3 vs. 2.7 tons per hectare). Estimated net income per season for farmers participating in Copa Connect trials has increased fourfold, to approximately $1,900 (*see Figure 10*).

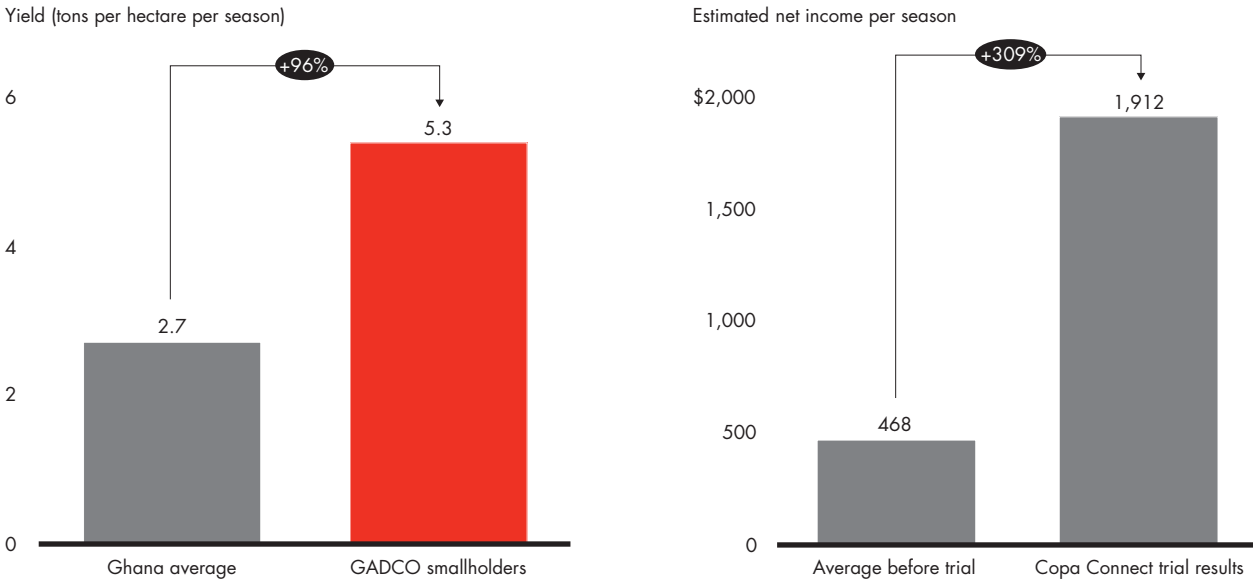
Put risk-mitigating structures in place to encourage initial adoption. Diseases or weather can wipe out a harvest or a herd of cattle. Pioneer firms can struggle to gain initial customer traction if they do not put in place risk-mitigation structures such as insurance[26] or guaranteed incomes to overcome concerns that a new product or service may not perform as expected or may succumb to a natural disaster. Juhudi Kilimo, for example,

Far from being a smooth, predictable path to building customer traction, the early days of a pioneer firm are often filled with failures and disappointments as the entrepreneur tries to validate the right customer proposition and business model.

includes insurance with its loans to protect both farmers and itself from the inherent risks of livestock farming. All farmers financed by Juhudi Kilimo are required to purchase insurance from the Kenyan Cooperative Insurance Company, which provides coverage in the event of a cow's death or illness. Farmers purchase the insurance, which costs 4% of the animal's value, when they register for the loan.

GEWP took an even more direct approach in persuading farmers to try its microdrip irrigation product. When the company was working with farmers to set up demonstration plots of one-quarter acre each, company representatives would ask farmers how much money they expected to earn from the yield of that much land. Since the company representatives understood the value of the crops, as well as how drip irrigation would increase yields, the company offered to pay each farmer the amount the farmer had suggested (as long as it was a reasonable estimate), regardless of actual yields. This essentially guaranteed the farmer a minimum income for that plot of land, eliminating the risk of the initial adoption. The microdrip systems ended up working so well that GEWP never had to pay cash to a farmer for a failed crop.

Figure 10: GADCO's smallholder farmers' yield is twice the Ghana average, and their incomes are four times higher



Sources: Interviews with GADCO management; Bassi Iggy, "Helping Private Players to Expand Rapidly: Providing Robust Evidence on Local Benefits," (presentation at the Annual World Bank Conference on Land and Poverty, Washington, D.C., April 8–11, 2013); "Realizing Africa's Wealth: Building Inclusive Businesses for Shared Prosperity," UNDP African Facility for Inclusive Markets, May 2013

Use "high-velocity" feedback to validate the advantage being created and refine the product or service and business model accordingly. Far from being a smooth, predictable path to building customer traction, the early days of a pioneer firm are often filled with failures and disappointments as the entrepreneur tries to validate the right customer proposition and business model. These continuous loops of trying, failing and learning are particularly relevant in the development of the product or service prototype. Rather than wait for a "big bang" rollout of the perfect product, pioneer firms should pilot a "minimum viable product"[27] with actual customers and use those customers' feedback to further refine their proposition.

GEWP refined its product design by gathering feedback from early adopters across dozens of villages in the initial district in Maharashtra, where it launched its operations. To stay in close contact with farmers and continually learn from pilots, the firm's employees, including members of the senior team, visited each village five to seven times a month to assess progress and tackle problems. These visits led to multiple product iterations to address various issues that farmers were facing, like burst pipes or clogged holes in the pipe. The firm also gave farmers prepaid postcards addressed to its managing director so that they could provide direct feedback. Similarly, as we saw in the earlier SV Agri example, customer feedback was pivotal in informing the company's decision to modify its customer proposition and business model. SV Agri's leadership realized it had to provide high-quality planting materials in addition to purchasing output at guaranteed minimum prices.

Advantage: Key questions to ask

- *Do you understand the specific need your company is addressing from the farmer's point of view?*
- *Do smallholder farmers sufficiently understand how your product or service will increase their income?*
- *What alternative solutions already exist that your target farmers are not using? Why not?*
- *Which gaps or constraints across the value chain can you address directly and which will require the support of partners?*
- *Do smallholder farmers have access to the complementary products necessary to gain the full advantage of your product?*
- *Do you have a clear process in place for observing your innovation in action with early adopters and for using the feedback to refine your proposition?*
- *How will exogenous factors (price shocks or environmental changes) affect the advantage provided?*
- *How much and what kind of risk mitigation is required for the earliest adopters?*

Affordability

Affordability is closely related to advantage, given that the two factors combine to shape a farmer's perception of a product or service's value. In designing for affordability, pioneer firms must address two fundamental constraints faced by the smallholder farmer: low purchasing power and uneven cash flows. Nearly as important as the absolute price of a product are the size and timing of a cash outlay required and the time it takes to reap a benefit. A product or service with short payback periods (over just one or two crop cycles) is more attractive and seen as more affordable to a smallholder farmer.

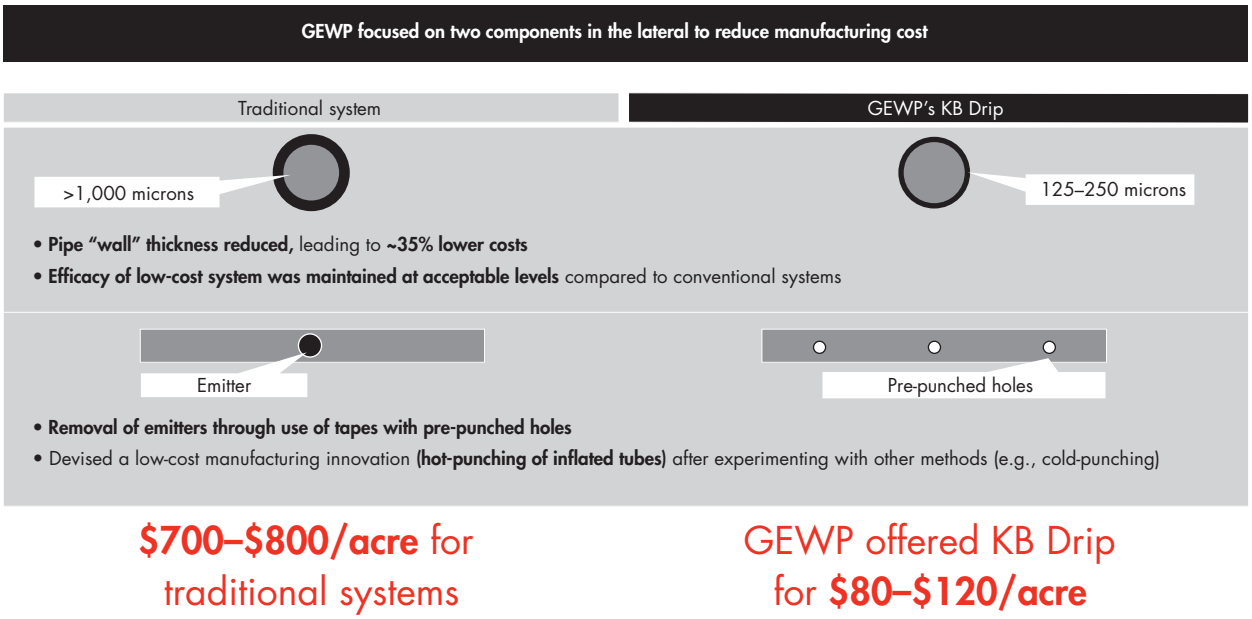
Design to optimize unit economics. To maximize affordability for customers while building a foundation for financial sustainability, pioneer firms must design their product in a way that optimizes profitability on a per unit basis. GEWP did just this for its microdrip irrigation product (*see Figure 11*). GEWP began this process by examining its cost structure and realized that lateral pipes accounted for 65% of the cost of an irrigation system. To reduce manufacturing costs, the firm designed the pipes with thinner walls than traditional systems (125 to 250 microns compared with more than 1,000 microns). This enabled the firm to lower the pipes' costs by 35% while maintaining the system's effectiveness.

It was able to further reduce costs by replacing plastic emitters with tapes with pre-punched holes. The firm also devised a low-cost manufacturing innovation to create the holes by hot-punching inflated tubes. By reducing its raw material costs through these design changes, GEWP was able to offer its microdrip system for less than $120 per acre (compared with $700 to $800 per acre for traditional systems) while still receiving a margin of nearly $20 per unit. The lower costs have not translated into less durability: Many farmers have been using the systems for up to seven years.

It is worth noting that pioneer firms can take years of product or service design experimentation to reach positive unit economics. Even when the production costs of goods are minimized, achieving profitability can still be enormously difficult due to the additional expense of the marketing, delivery and support required to serve such a challenging customer segment. Across our case studies, companies had all wrestled with sustained periods of unprofitable growth. Many continue to struggle to find a path to profitability today. However, although we acknowledge the profitability challenges faced by pioneer firms, we believe that a viable path to longer-term financial sustainability must begin with a structurally profitable product or service.

Design to facilitate customers' incremental purchase. Given smallholder farmers' limited purchasing power, it is imperative for firms to design products and services that are better suited to small plots and small initial investments. As mentioned, traditional drip irrigation systems were designed for larger farms and were not affordable to smallholder farmers. GEWP's innovation was to miniaturize and modularize the system to allow for easy testing and incremental additions on smallholder plots. GEWP systems can be used on a small section of a field, as small as one-quarter of an acre; once that system is set up, adding to it incrementally is relatively easy. A new GEWP system requires installation of a main valve, a screen filter and a main line originating from a water source—typically a bore well (*see Figure 12*). The farmer lays out an initial set of lateral pipes (plastic

Figure 11: GEWP radically redesigned the materials accounting for most of its product's costs and reduced the system's price by 80%



Note: The lateral pipe is the plastic piece used for water distribution to the plant in a drip irrigation system.
Source: Interviews with GEWP management

pipes used in the last section of water distribution). The only additional work required if a farmer wants to add to the system is to extend the sub-main line. Not only did the GEWP system as a whole cost considerably less than other systems available at the time, the system was optimized for trialing; benefits from a small initial purchase could be observed and the system can be easily extended to more of the farmer's land. All of these elements together have made GEWP's innovation affordable and accessible to a previously unserved farmer segment.

Understand cash-flow cycles and timing and align financing options. As discussed in Chapter 2, farmers' income and cash flow can be irregular and the optimal time for them to make purchases is dictated by seasons and harvesting cycles. This makes it hard for farmers to save or spend large sums required for upfront payments for new products or services. Unconventional means of financing and risk sharing are often required so that cash flow constraints do not impede adoption. For example, although OAF provides inputs to farmers at a higher price than they would pay in local markets (about $80 per package vs. $70, when inputs are purchased separately from agrovets),[28] it offers a flexible repayment plan and timely access to inputs. As one farmer explained, "I am able to pay back the loan after my harvest over a longer period. This flexibility is important given there are many other needs I must also meet and many that can be unexpected." This sentiment was widely shared among the many OAF farmers we interviewed.

Other research has shown that the benefits of offering financing directly may outweigh the significant complications. For example, a recent Hystra report argued that "in addition to reducing the risk both for customers and operators, in-house financing can be a profit-making activity that has been seen to increase returns on sales by 3% to 15%."[29] In practice, we have observed mixed results when firms try to take on in-house financing for their customers: Although these activities can generate profits and drive affordability, they can also create significant tensions within the firm that can prove difficult to

Unconventional means of financing and risk sharing are often required by smallholder farmers so that cash flow constraints do not impede adoption.

manage. Whether firms continue to experiment with direct provisioning of credit or instead choose to partner with banks or microfinance institutions (MFIs), they should actively consider credit extension to serve this target market.[30]

Harness volumes and increase operating model efficiency to drive down unit cost/price. The virtuous cycle of broad adoption allowing for greater production volumes, which in turn leads to lower prices and then to yet more adoption, is a well-accepted tenet of management thinking. The need to reduce unit cost is especially important over time for the pioneer firm as lower-cost competitors start entering the market. As we will illustrate in the next chapter, "Repeatable Models," achieving this "experience curve effect" can be less straightforward in the context of developing-market agriculture, given the challenge of consolidating volumes across a wide geographic area. Specifically, we will illustrate the challenges that GEWP faced and what other firms can learn from its experience.

The imperative of driving down unit cost through greater operational efficiency is equally relevant for service companies. For example, Juhudi Kilimo sought to improve the branch profitability of its microfinance business after experiencing inefficient and unprofitable operations during its early, grant-funding days. Based on research from other MFIs and agricultural lenders, the company set new targets for critical operating metrics. It then adapted business processes to meet the higher productivity (from 120 to 250 clients per officer) and repayment ratio targets (from 87% to 94%). This new business model has enabled Juhudi Kilimo to achieve profitability at the branch level over time. A single branch with a $400,000 loan portfolio now earns profits of more than $10,000 on income of approximately $126,000.

Affordability: Key questions to ask

- *What are the key cost drivers for your product or service for the individual farmer?*
- *How can you reduce the cost through redesign of your product or service proposition while delivering the requisite functionality for your customers?*
- *To what extent can the timing of the purchase of the product or service be managed to enhance its affordability?*
- *Given the income levels and cash-flow profiles of your target customers, what financing options might you need to provide?*

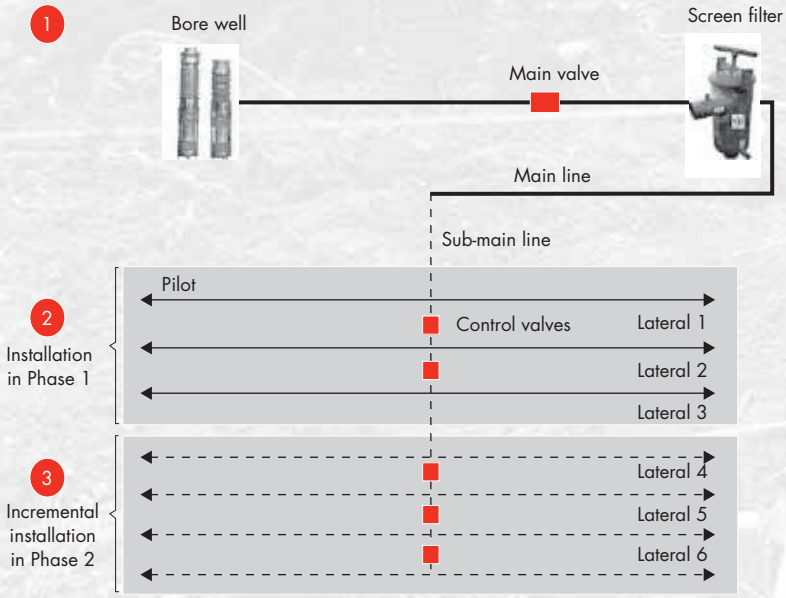
Access

The importance of last-mile access for farmers in rural areas has been written about extensively. Given the need for geographically dispersed smallholder farmers to access physical inputs at the exact right time in the crop cycle, farmers' proximity to an agricultural product, like a bag of seed or fertilizer or a mechanized implement, is even more important than it is for other low-income-focused products, such as solar lights or clean cook stoves, which can be more easily transported. Some products may also require more continuous after-sales service, in which case the firm's continued presence in the community will be a large part of the value proposition.

However, pioneer firms should consider existing retail options and actual buying behaviors and mobility constraints before defaulting to a last-mile distribution model. Once again, a fine-grained understanding of farmers' needs in the context of a specific innovation is essential.

A GEWP system in place in Maharashtra, India

Figure 12: GEWP designed its product for ease of product trials and incremental addition, reducing the barriers to adoption



1. For each plot, the farmer needs to install a **main valve, filter and main line** originating from the water source (typically a bore well)
2. The **laterals could then be laid out based on need**; product designed such that system could be adopted on a small section of field (as small as 0.25 acres)
3. Once convinced, the **farmer could add additional laterals to his existing system with minimum effort** (only requires extending the sub-main line)

Source: Interviews with GEWP management

Plan production and distribution in advance to ensure access in the right quantities at the right time. OAF considers access such a critical factor that it insists on delivering its inputs to farmers on the day they need them and within walking distance—generally less than five kilometers. OAF's director of operations in Kenya put it this way: "For 10 months of the year, we are a school and a bank; the other two months, we are a logistics company." In Kenya, OAF runs a tightly managed logistics operation to ensure it can, in eight weeks, deliver inputs to more than 80,000 farmers at 530 sites located throughout 16 districts. Achieving this level of effective access requires careful advanced planning and rigorous management of production, sales and distribution. In fact, dates for delivery are set one year in advance, because sowing seeds even a few days late may reduce yields.

The ability to master a distribution system this complex, whether the system is company-owned or relies on partners, is a crucial factor in success as companies grow to serve more, and more dispersed, customers. Timing is generally very important but can be critical for some products. For example, artificial insemination delayed by a few days might mean needing to wait another month for the animal to be in heat again. For companies operating in these industries, getting the distribution timing right is a must.

SV Agri offers a different example of how pioneer firms can build an effective distribution network. The company invested heavily in a network of franchisees to distribute its products and services to potato farmers. The firm looks for individuals committed to SV Agri's business and impact model who have deep social connections in their village. It provides franchisees with annual training in agronomic and business practices. It also supports them throughout their business cycle by supplying inputs to their shops; by providing equipment and expertise required for soil testing, pest management and potato quality testing; and by procuring potatoes at harvest time.

Carefully consider what kind of distribution network is required, given farmers' purchasing habits. Retail outlets can be effective for providing access to certain types of products and services. For example, Kenyan farmers travel to Sidai's Livestock Service Centers, even in remote locations, to buy livestock and crop inputs, such as vaccines, feeds and seeds. The firm has designed a modern retail format that offers open access to customers, as well as the opportunity to discuss products with

well-informed sales staff. Depending on its product or service, a firm can also piggyback onto an existing distribution network rather than create a new one. For example, GEWP found that many of its customers owned motorcycles and regularly traveled to the nearest town or city to purchase agricultural inputs. Instead of establishing its own outlets or logistics capability to sell KB Drip, the firm created a network of third-party dealers in these locations that were already selling related products, like pipes, pumps and ancillary electrical equipment.

Access: Key questions to ask

- *How and where do your target customers currently purchase agricultural products and services?*
- *What is the condition of the physical infrastructure in the areas you are serving?*
- *Do your target customers have access to means of transportation and to what extent are they willing to travel?*
- *Are there existing retail outlets that could reliably and effectively sell your product (and provide both the required information and physical distribution)?*
- *How would selling through a retail outlet affect your economics and your competitiveness from both the retailer and end customer perspective?*
- *To what extent does distribution timing affect the advantages that your product provides?*

The Four A's, rationality and emotion

As the authors of *Scarcity: Why Having Too Little Means So Much* have pointed out, being poor greatly affects decision making and, most often, impairs it. The significance of the trade-offs being made and the limited amount of resources with which to make them often lead to decisions that keep the poor in a "scarcity trap."[31] The Four A's framework is built on the assumption that if farmers are able to see the potential advantages (increased yields and wealth) that could be achieved by adopting a product, they would do so. Although this is true for most farmers, particularly those who see their land as a productive asset and their labor as a means to generate more income, we acknowledge that for the poorest farmers or those confronting the challenges and trade-offs required when, for example, providing for a sick family member or sending a child to a better school, rational decision making is not so straightforward.

In addition, there is another A that influences adoption by customers everywhere: aspiration. Often, purchase decisions are based on factors other than those stated and then rationalized after the fact. The emotional intensity a customer may feel about seeds or irrigation equipment can seem exaggerated, but these products also symbolize social status, and he will purchase them in the hope that they will improve his family's life—enable him to build a new room, buy a motorcycle or allow his child to move to the city. Thus, beyond convincing customers of the compelling advantages of a product's purely functional utility, appealing to customers' aspirations is a key aspect of spurring adoption.

A checklist: The Four A's

Getting the Four A's right is paramount for creating a foundation for adoption. Below is a set of key questions to help entrepreneurs systematically ensure that each of the Four A's is in place for their farmer customers.

Awareness

- ☐ To what extent do farmers know about your product or service *category* (e.g., microfinance, micro-drip irrigation) and about your specific company *offering*?
- ☐ What characteristics (e.g., demographic, behavioral, environmental) should guide your sales team's *early-adopter* customer targeting efforts?
- ☐ Is the accompanying information (e.g., planting techniques, installation) critical to your product's effective use always shared and well understood?
- ☐ What are the most effective communication channels to reach your target customers?
- ☐ How will you identify the "promoters" among your early-adopter customers and empower them to tell other prospective customers about your product or service?

Advantage

- ☐ Have you understood the specific need your company is addressing from the farmer's point of view?
- ☐ Do smallholder farmers sufficiently understand how your product or service will increase their income?
- ☐ What alternative solutions exist today that your target farmers are not using? Why not?
- ☐ Which gaps or constraints across the value chain can you address directly and which will require the support of partners?
- ☐ Do you have a clear process in place to observe your innovation in action with early adopters and use the feedback to refine your proposition?
- ☐ How will exogenous factors (price shocks or environmental changes) affect the advantage provided?
- ☐ How much and what kind of risk mitigation is required for the earliest adopters?

Affordability

- ☐ What are the key cost drivers for your product or service on an individual farmer level?
- ☐ How can you reduce the cost through redesign of your product or service proposition while delivering the requisite functionality for your customers?
- ☐ To what extent can the timing of the purchase of the product or service be managed to enhance its affordability?
- ☐ Given the income levels and cash-flow profiles of your target customers, what financing options might you need to provide?

Access

- ☐ How and where do your target customers currently purchase agricultural products and services?
- ☐ What is the condition of the physical infrastructure in the areas you are serving?
- ☐ To what extent are your target customers willing to travel and have access to means of transportation?
- ☐ Are there existing retail outlets that could reliably and effectively sell your product (providing both the required information and physical distribution)?
- ☐ How would selling through a retail outlet affect your economics and your competitiveness from both the retailer and end-customer perspectives?
- ☐ To what extent is the advantage provided by your product affected by distribution timing?

The Four A's from blueprint to scale

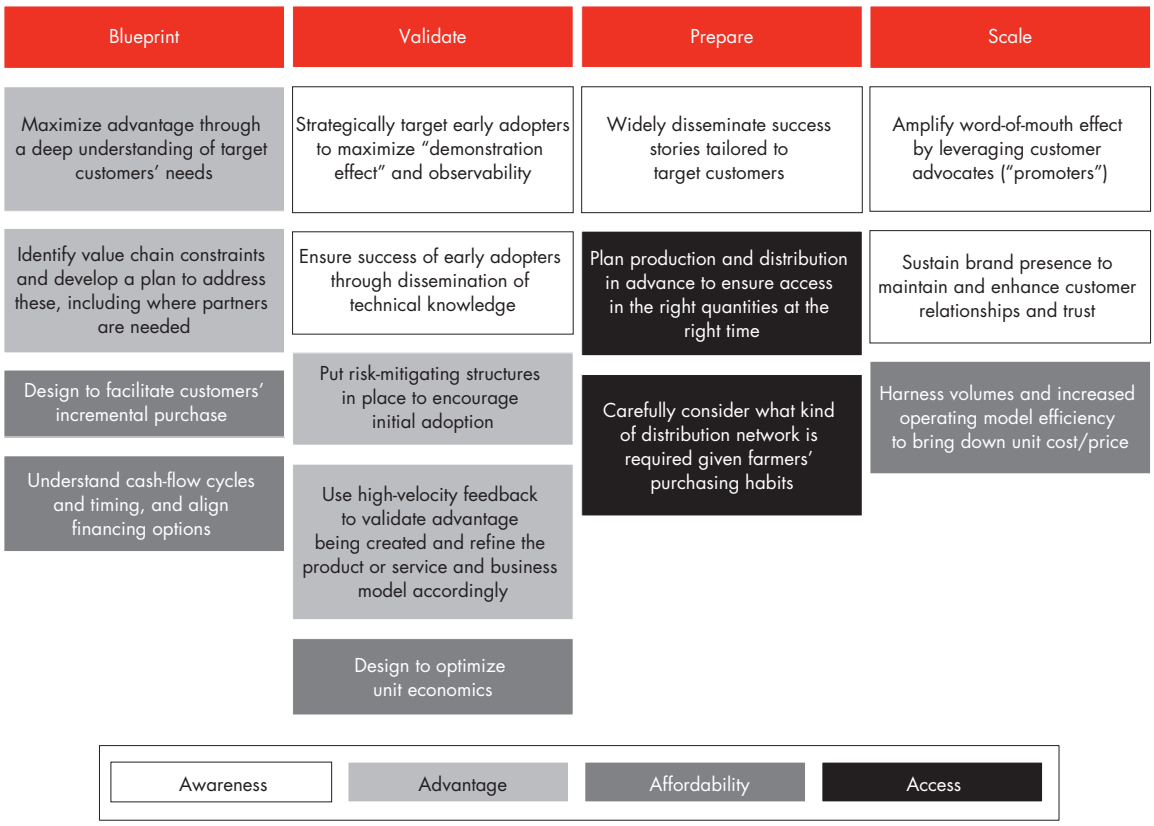
From Blueprint to Scale: The Case for Philanthropy in Impact Investing, a previous report by Acumen and Monitor Inclusive Markets, provides a framework for the four stages of a pioneer firm[32]:

Blueprint. As a first step, firms need to create a detailed design for their future business. This entails selecting and developing a product or service to serve the target community of farmers, as well as a business model for bringing it to the market.

Validate. Next, the firm needs to test and refine the product or service, as well as the business model. This includes identifying which farmers could be the initial adopters and testing the product or service with them to generate a "demonstration effect" that will persuade other farmers to adopt it.

Prepare. After validating their innovations, firms need to ensure that relationships, channels and systems are in place for achieving scale. These include partnerships, distribution channels and approaches for promoting awareness.

Scale. To enable a rollout that reaches a large number of farmers, firms must reduce costs, promote advocacy by existing customers and sustain their brand's presence in the market.



Source: Bain & Company

(Continued)

To help firms apply the Four A's, we mapped them against these four stages of a pioneer firm's development. Although the Four A's are relevant at all stages of a company's growth, advantage and affordability will be the primary focus early on, when the firm is determining a product's suitability for the market. Access and awareness will become increasingly important later when the firm focuses on achieving scale.

More specifically, in the Blueprint and Validate stages, pioneer firms need to focus on being able to deliver a core product that creates advantage at an affordable price with a trial-size cash outlay. High-velocity feedback loops drive improvements in the product as the company adjusts to customer preferences. And it is important that the firm, even at this early stage, strike the right balance between affordability and a pricing model that has a view toward the long-term financial viability of the enterprise.

As the firm progresses to the Prepare and Scale stages, generating awareness by disseminating the core marketing message and customer success stories is at the core of driving further adoption, along with expanding access by using a strong distribution model that allows for sustained penetration of the company's core market.

From the outside, these four steps might seem intuitive enough. However, what is less apparent is that the step from Prepare to Scale can often feel more like a chasm for the pioneer firm. Within the context of smallholder agriculture in developing countries, adoption at scale needs to occur at multiple levels: villages, regions and countries. Differences within and across these markets are among the most significant barriers to making the adjustments that growth requires. In the next chapter, we explore how firms can use Repeatable Models to achieve "good scale" and drive sustained, widespread adoption.

24 Everett M. Rogers, *Diffusion of Innovations*, 5th ed., New York: Free Press, 2003.

25 See Net Promoter System℠, a Bain & Company website, http://www.netpromotersystem.com/ for more information. Our primary research with farmers also made this clear, as more than 65% of early adopters heard about a product or service from a company official. This dropped to only 28% for late adopters, for whom friends and relatives make up over 55% of the first information providers.

26 Potentially bundled with other products or ways of mitigating risk, given the relative complexity of a product like insurance.

27 Steve Blank, "Why the Lean Start-up Changes Everything," *Harvard Business Review*, May 2013.

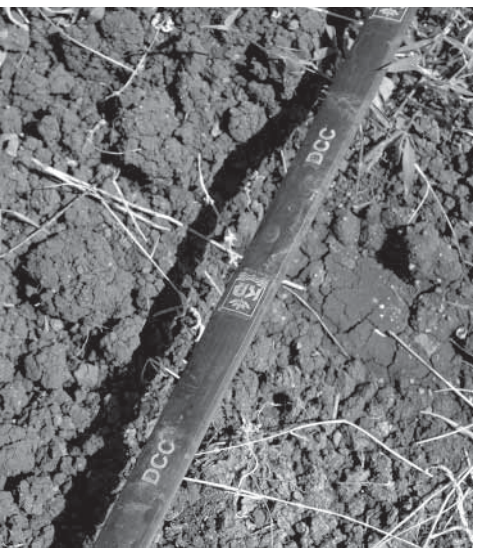
28 OAF also provides the farmer with training and crop insurance as part of the package, which increases the overall price.

29 Hystra, *Marketing Innovative Devices for the Base of the Pyramid*, Paris: Hystra, 2013.

30 It is worth noting that almost all of the GEWP customers we interviewed in India purchased KB Drip from their family savings. We can't help but wonder how greater access to financing in this case might have facilitated the faster and broader adoption of microdrip irrigation.

31 Sendhil Mullainathan and Eldar Shafir, *Scarcity: Why Having Too Little Means So Much*, New York: Macmillan, 2013.

32 See Harvey Koh, Ashish Karamchandani and Robert Katz, *Blueprint to Scale: The Case for Philanthropy in Impact Investing*, Mumbai: Monitor Inclusive Markets/Acumen, 2012.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Farmer profile: Rangnath

An early adopter of GEWP's microdrip irrigation (KB Drip)

Rangnath* owns several acres of land in Maharashtra, India. He grows mostly pomegranates, tomatoes and chilies. Though his sons help him run the farm, he is the final decision maker on the adoption of new agricultural products and services.

"I heard about KB Drip in 2007 from company officials who drove to my village," says Rangnath. "They told me I could save water at a fraction of the cost of the more expensive systems I'd seen on larger farms," he says. Given his limited purchasing power, he had instead run a generator that pumped water to flood his fields.

He and his sons decided to buy KB Drip because of the severe drought that struck the region. Initially skeptical about the product's benefits, they agreed to let GEWP install drip irrigation on a small plot where they grew tomatoes. After two months, they saw how many more tomatoes grew per vine, how a relatively small amount of water could cover a large area, and how weeds were reduced because the water dripped only onto the tomato plants.

Rangnath purchased KB Drip for only a quarter of his land, paying for it from the family's savings because he could not take out a loan. He has since invested more in microdrip irrigation and is now using it on nearly half his land (on the other half, he wants the flexibility to grow dense crops, such as wheat or corn, for which drip irrigation is not appropriate). "Using KB Drip has increased my yield considerably and allowed me to continue farming despite the drought. I have doubled my income and built another house," he says proudly.

** Full name and select personal details have been disguised*

4.

Repeatable Models: The key to achieving "good scale"

This chapter discusses in detail the elements of Repeatable Models, which are key to pioneer firms' ability to achieve sustainable growth and encourage mass adoption. We profile three companies that are building their own Repeatable Models to ensure the Four A's are in place as they grow, putting them on the path to "good scale." We also offer a cautionary tale of a firm caught in a "bad scale trap."

"Complexity is a silent killer of profitable growth. Successful companies build a 'repeatable business model' that produces continuous improvement and allows them to rapidly adapt to change without succumbing to complexity."

—*Repeatability: Build Enduring Businesses for a World of Constant Change*
By Chris Zook and James Allen

Repeatable Models: The key to achieving "good scale"

For pioneer firms, getting the Four A's right is paramount for creating a foundation for farmers to adopt innovations.

However, the challenge of scaling adoption, across villages, regions and countries over and over again, is often an arduous journey. The reality remains that very few firms have achieved widespread mass adoption of their product or service. In reviewing the performance of 100 pioneer firms focused on selling to or buying from smallholder farmers in South Asia and sub-Saharan Africa, we found less than 5% with more than 250,000 customers or 25,000 suppliers in a single year.

So, how can agriculture-focused pioneer firms achieve scaled adoption?

We believe the solution lies with Repeatable Models.

In addition to a solid understanding and application of the Four A's, a firm must also have a Repeatable Model with the right strategies, processes, teams and supporting systems if it is to be able to handle the challenge of scaling to serve hundreds of thousands or millions of farmers. All too often, firms have attempted to extend their reach before putting these in place, resulting in unmanageable costs and increasing complexity that can thwart the successful scaling of even the most promising innovation. This is the "bad scale trap" that shrinks margins and undermines pioneer firms' early success.

Companies using Repeatable Models start by clearly defining their core market and their distinctive competencies. Before expanding beyond their core, these companies establish clear operating processes and performance management systems, as well as values and behaviors, and embed them into all levels of the organization. As companies expand to new markets, they adopt systematic entry routines while maintaining the agility to adapt. Throughout the process of scaling, they actively gather feedback from customers on whether and how the Four A's are in place and rigorously monitor performance metrics. They then use that information to refine their model to maximize the benefits of the Four A's for the local context. Last but not least, companies invest in the right talent and technology systems to enable the delicate balance of standardization and adaptation as the company grows.

In effect, by getting the Repeatable Model right, pioneer firms will be able to promote adoption of their innovation in an adaptive and increasingly efficient and effective manner, while ensuring sustained, profitable growth: in other words, achieve "good scale."

Thinking through the elements of a Repeatable Model is helpful for businesses at any stage of growth. But it is most applicable to those that have been operating for a number of years and have started to gain market traction. At that point, the firm is clear on the viability of its business model and the attractiveness of its value proposition. It is now ready to pursue a step change in bringing its product or service to more customers across more areas in a shorter time than ever before. This chapter uses case studies—a cautionary tale as well as several successes—to illustrate how essential Repeatable Models are for helping pioneer firms achieve good scale.

The "bad scale trap"

In 2011, India-based GEWP, maker of the low-cost KB Drip irrigation system, seemed poised on the brink of an exciting growth phase. In November 2007, IDEI, the NGO from which GEWP was founded, received a grant from the Bill & Melinda Gates Foundation to build market awareness and stimulate demand for microdrip irrigation. As a result of this increased awareness, annual sales growth jumped from 40% in previous years to 73% on average from 2008 through 2011. In 2011 alone, some 65,000 farmers purchased KB Drip products, driving revenue to a high of $3.8 million. This success story was

well documented in *From Blueprint to Scale: The Case for Philanthropy in Impact Investing*,[33] which ended on a hopeful note for the company as it "push[ed] forward into scaling."

This is where the story takes a dramatically different turn. GEWP's revenues fell almost 40% from its 2011 peak to $2.3 million in 2013. At the time of our study in 2014, GEWP had retrenched to Maharashtra and Karnataka with satellite offices in Madhya Pradesh and Tamil Nadu and was in the process of stabilizing its business performance and learning from its earlier missteps.

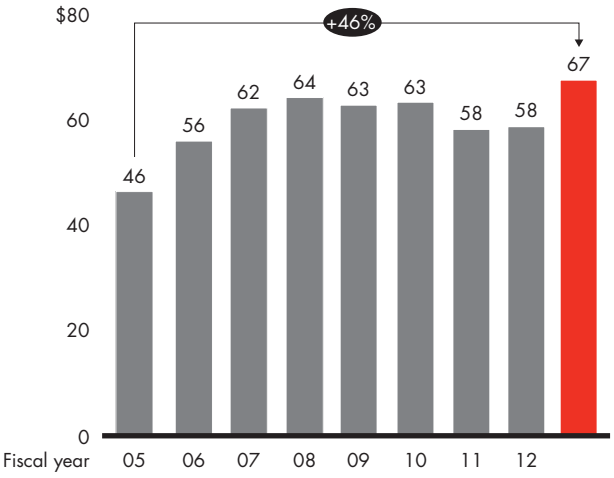
What happened? The rapid geographic expansion introduced costly complexity at a time when the business was under intense competitive pressure in its original market. As those familiar with India well know, moving across state lines can pose unique challenges. Production scale economies were not possible because the poor transport infrastructure and interstate taxes necessitated new contract manufacturing partnerships in each state. The firm had to make additional fixed-cost investments in new warehouses and hire new salespeople who spoke the local language. As GEWP founder, Amitabha Sadangi, succinctly put it, "In hindsight, entering each new state was like entering a new country." As a result, the significant increase in salesforce—from 46 in 2011 to 166 in 2012—did not translate to commensurate revenue increases.

During this same period, GEWP faced stiff competition in the states of Maharashtra, Madhya Pradesh and Karnataka, where the penetration of microdrip irrigation was estimated at less than 10% of the addressable market.[34] GEWP's early success had led to copycat competitors, many of whom were selling an inferior product at a lower price. Some of these copycat competitors were even prior GEWP-licensed contract manufacturers who decided to develop their own go-to-market proposition. These manufacturers had worked for more than six years with GEWP and gained knowledge of KB Drip tapes, packaging and supply chain information; they started their own low-cost drip irrigation brands and posed stiff competition in the same market. GEWP was

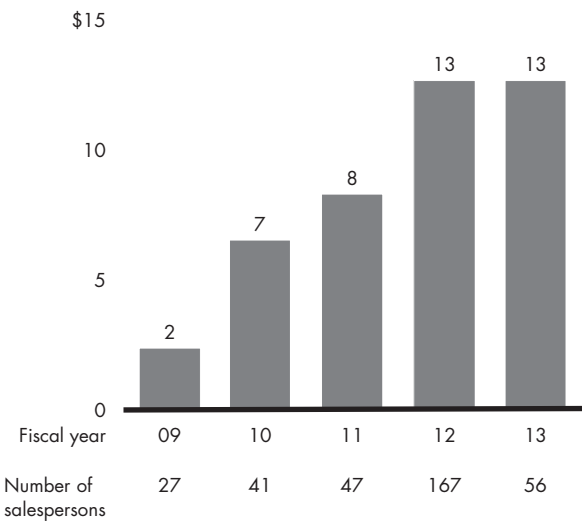
Photo taken near Aurangabad in Maharashtra, showing GEWP's KB drip product (bottom right) together with the drip tape of five other competitor products.

Figure 13: GEWP was unable to reduce unit cost or customer acquisition costs

Average KB Drip price per acre (adjusted for inflation)



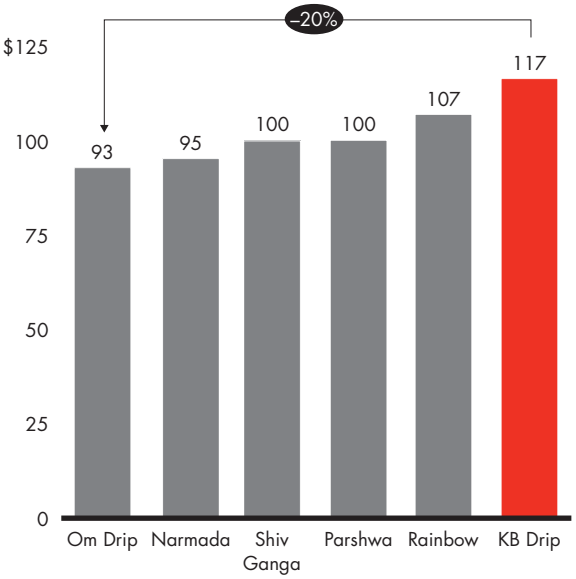
Sales and distribution expense per customer



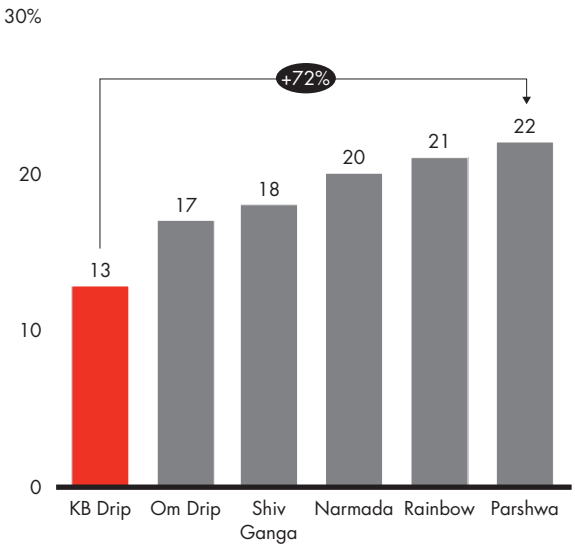
Notes: USD to INR exchange rate is based on average yearly exchange rates; inflation adjusted with 2005 as base year.
Source: GEWP company data

Figure 14: GEWP's low-cost competitors grew sales through lower prices and higher dealer margins

Price per acre to customer



Dealer margin



Source: Bain primary research with dealers

especially vulnerable because it had not been able to bring down unit cost significantly (*see Figure 13*), and it had little control over the price of polypropylene, which made up more than 60% of the cost of goods sold.

After the marketing blitz of the early years, which had sparked awareness of the product, GEWP had reduced its investment in sustaining its brand presence. Consequently, GEWP's nonexclusive dealers had a relatively easy time persuading first-time customers to purchase their rival products, which gave dealers higher margins (*see Figure 14*). In addition, some longer-term users, having improved their livelihoods in part through use of KB Drip, upgraded to costlier, even higher-quality products, some of which were subsidized through a government scheme.

Last but not least, GEWP went through a series of management changes that left the organization without consistent leadership that could help diagnose and address many of these issues.

GEWP, in effect, became a victim of its own success: Significant demand for microdrip irrigation and the emergence of competitors, at a time when management was distracted with entering multiple new markets, eroded its original market leadership position. Ironically, GEWP's ambitious pursuit of scale ended up undermining its growth, profitability and ability to stimulate mass adoption. And there were signs of collateral damage: At the time this paper was written, the addressable market for microdrip irrigation remained significantly underpenetrated, with no critical mass of leading players, suggesting that a healthy sector has yet to emerge.

GEWP had fallen into what we call the "bad-scale trap"—scale achieved through premature and overextended expansion without the necessary strategies, processes, teams and supporting systems in place. The risk of falling into this trap is especially high in the context of agricultural pioneer firms. GEWP's case illustrates the complications of expanding not just across state lines but even within a particular state or region. Differences across villages in ecological conditions, infrastructure quality, social structures, language and experience with innovations often require adaptation in product or service design, as well as how a company goes to market. Such adaptations, when not deliberately managed, often introduce costly complexities that challenge the foun-

Photo credit: One Acre Fund

dations of the pioneer firms' earlier success. As Chris Zook, leader of Bain's Strategy practice, has noted, "complexity is the silent killer of profitable growth."[35]

What are the implications for the pioneer firm if the path to profitable, sustainable scaling—good scale—is so perilous? The answer lies in building Repeatable Models. The best Repeatable Models are built on the foundation of a company's greatest successes and they enable the company to replicate these successes over and over again with new customers, new geographies and even new products. But although the need for, and benefits of, a Repeatable Model may be obvious, actually building and executing such a model takes considerable time, effort and patience. In the next section, we will explore *how* to build Repeatable Models in the markets relevant to pioneer firms.

The foundations for repeatability

Bain & Company has been working with high-performing companies across a range of industries and countries for decades. This experience has helped us identify what is required for companies to sustain their success over time. As outlined in the article "The Great Repeatable Business Model"[36]:

Really successful businesses build their strategies on a few vivid and hardy forms of differentiation that act as a system and reinforce one another. They grow in ways that exploit their core differentiators by replicating them in new contexts. And they turn the sources of their differentiation into routines, behaviors and activity systems that everyone in the organization can understand and follow. Powerful differentiations deliver enduring profits only when they are supported by simple, nonnegotiable principles and robust learning systems that drive constant improvement across the business.

As we interviewed management teams at the 11 case-study companies, we found that those who were successfully pursuing sustained scale were implementing aspects of Repeatable Models. In this section, we lay out the elements of Repeatable Models, having tailored the framework for agricultural pioneer firms operating in very challenging markets and starting from a smaller base of customers. Our goal is to provide the leaders of pioneer firms with a way to think through and discuss their path to good scale with their management teams, frontline personnel and investors.

Really successful businesses grow in ways that exploit their core differentiators

Building and executing Repeatable Models: A four-step process

1. Focus: What is your "core," and how should you prioritize your growth options?

The core. As simple as it sounds, a Repeatable Model starts with articulating a business's core from two perspectives: which markets you will serve and how you plan to succeed. The first requires strategic choices about "where to play"—which customers, products, regions, channels and value-chain activities the company will focus on. The second refers to the few (usually four to seven) distinctive assets or capabilities that are at the heart of a company's differentiation. Examples of these could be scale and cost leadership, proprietary intellectual property and technology, superior customer experience and loyalty, speed of new product innovation, marketing or supply-chain management. Essentially, this step defines the parameters of the firm's addressable market: the target customers for which a pioneer firm is optimized to deliver on the Four A's.

Penetration. A pioneer firm should focus on penetrating and achieving full potential in its core market. Within the parameters of a core market, there is generally a large degree of sharing of customers, costs, channels and capabilities. This shared platform helps drive scale economies and customer advocacy, which, in turn, strengthens the firm's competitive advantage. In markets where pioneer firms operate, it may be challenging to accurately assess their penetration of the addressable market, because good market data can be hard to come by. However, even rough estimates on a village-to-village basis can contribute to this base knowledge of how successful the firm is in a given region. To be clear, by "full potential" we mean the optimal performance that can be expected for the delineated market, not the complete coverage of an entire customer base.

Adjacency growth. Pioneer firms should evaluate adjacency options based on their proximity to the core. Bain & Company research across 154 companies' adjacency moves shows that the further an adjacent growth opportunity is from your core, the less likely you are to succeed. If a new proposed area of your business will require you to sell to new customers in new geographies through new channels, and if doing so will require your staff to develop new capabilities, then the odds of success decline significantly (*see Figures 15 and 16*). This is all the more true when pioneer firms have had to overcome numerous financial, logistical and HR obstacles to establish operations in the first place.

2. Embed: Have you established the routines and culture to consistently translate your strategy into action?

Hardwiring. The strategy of the business should be translated into clear activities through to the front line and consistently executed. Frontline routines have to be codified, and employees need to be effectively trained to ensure that operations are efficient and the customer experience is consistent. This requires near-constant management focus on making sure employees know what the company stands for and are able to execute the routines that make up the company's operations. Ongoing training and reinforcement help make this goal achievable.

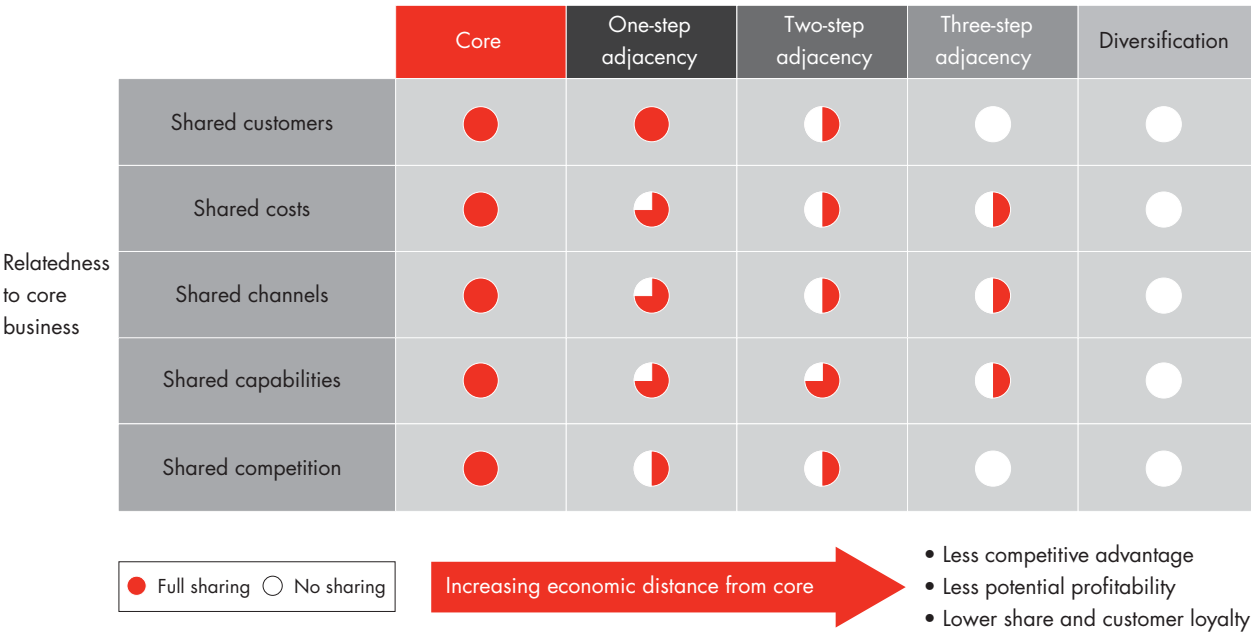
Market entry routines. Ensure that your teams understand how to calibrate the pace of expansion and how to enter and activate new markets. As mentioned, the agricultural pioneer firm's path to scale has to be conquered village by village, region by region, country by country. Geographic expansion is fraught with challenges. Differences in tribes, languages, social customs, regulations and ecological conditions are just a few of the variables that can make success in a new area difficult to achieve. So, pioneer firms must develop and execute routines that guide market entry at all levels: metrics that trigger consideration of expansion, methodology for evaluating the attractiveness of a new market and an approach for entering and activating a new market that maximizes a firm's chances of success.

Nonnegotiables. Make clear the values and behaviors that define the culture and founder's mentality of the pioneer firm. Organization effectiveness is, to a large extent, driven by decision effectiveness, and decisions are informed by the values and behaviors supported by the firm. According to authors Chris Zook and James Allen, this is "a fundamental building block of repeatability, a way of keeping everyone on the same page. Nonnegotiables translate the most important beliefs and assumptions underlying the company's differentiation into a few prescriptive statements that all employees can understand, relate to and use as a reference point for making trade-offs and decisions."[37] Particularly given the vulnerability of pioneer firms' customers, it is critical that the company make very clear the ethos that should inform employees' actions.[38]

3. Adapt: Have you set up the feedback and learning systems to continually adapt and innovate?

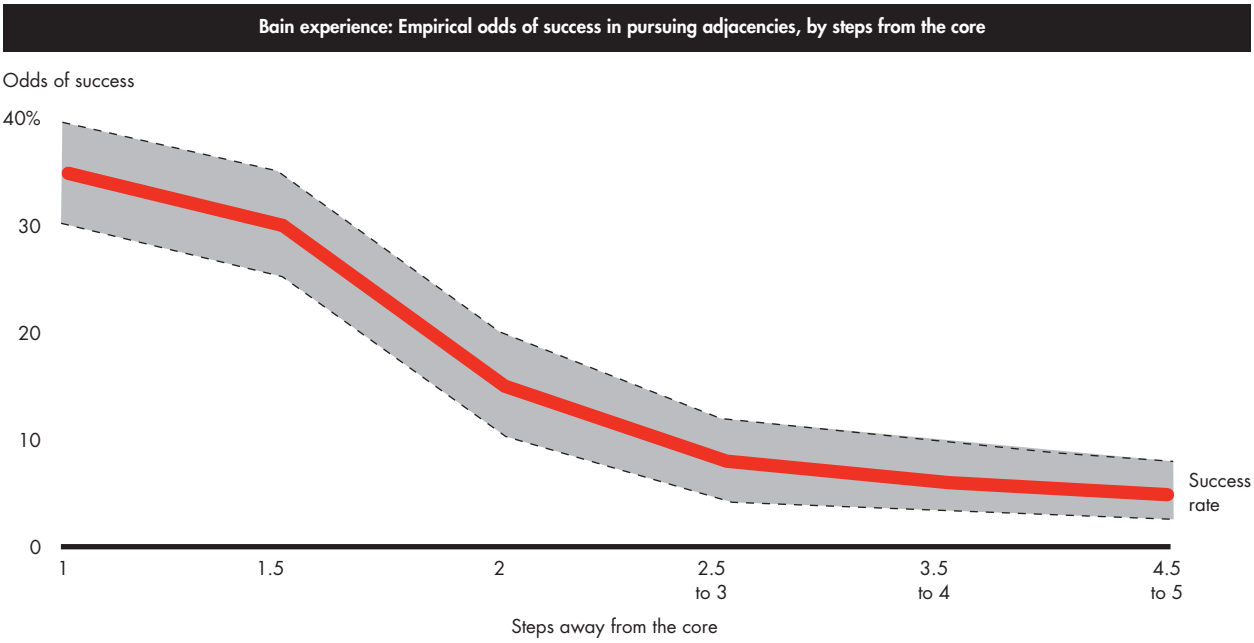
Voice of the customer. Set up customer feedback systems to ensure that the Four A's are continually and optimally addressed. Like any business, pioneer firms need to keep the customer front and center. Feedback from customers lets the firm know if customers are continuing to use the product or service, if and how preferences are changing

Figure 15: A business's core shares key characteristics and determines the likelihood of success for adjacency growth

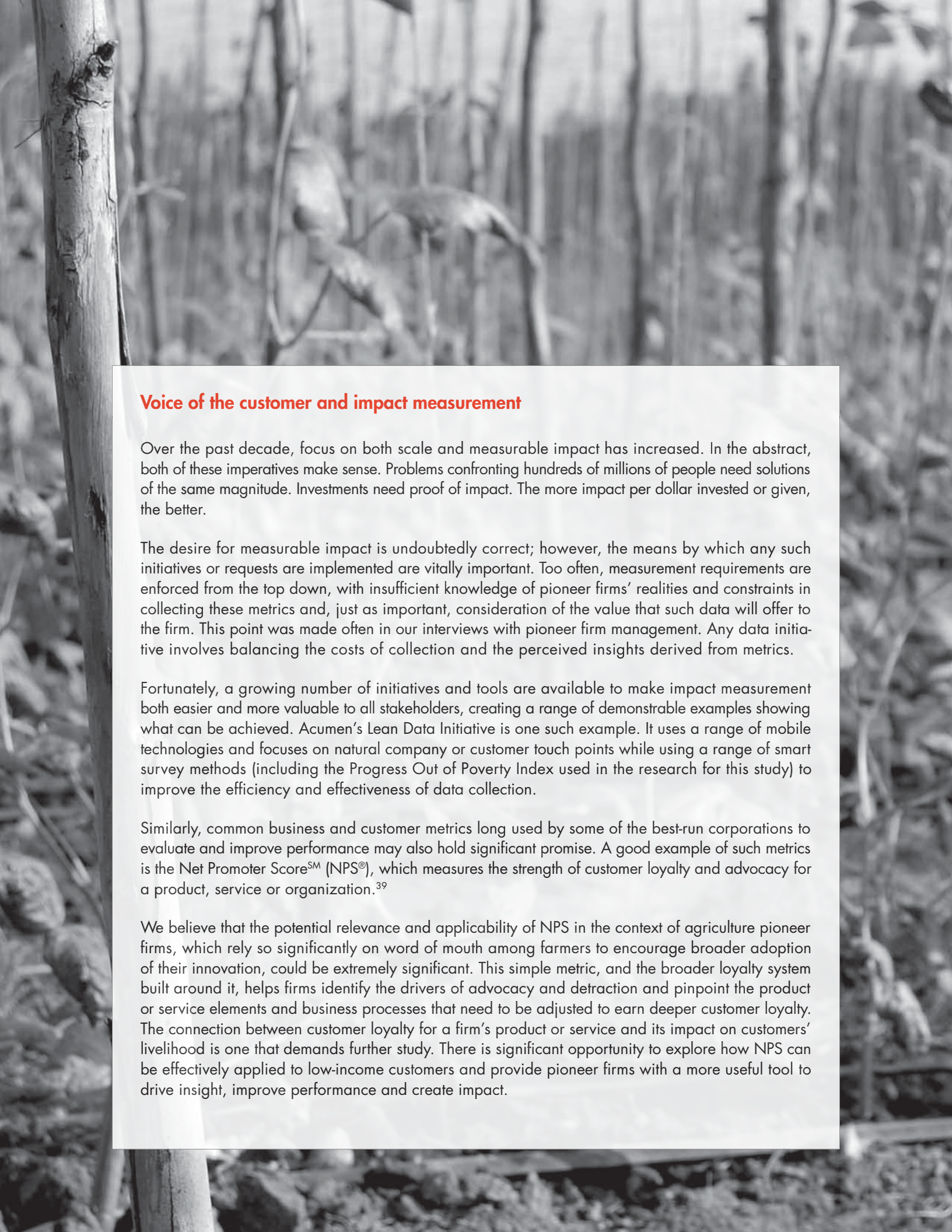


Source: Bain analysis

Figure 16: Relatedness to the core drives success



Source: Bain analysis of 181 adjacencies, 2002 (n=154 US and European companies in 84 industries)



Voice of the customer and impact measurement

Over the past decade, focus on both scale and measurable impact has increased. In the abstract, both of these imperatives make sense. Problems confronting hundreds of millions of people need solutions of the same magnitude. Investments need proof of impact. The more impact per dollar invested or given, the better.

The desire for measurable impact is undoubtedly correct; however, the means by which any such initiatives or requests are implemented are vitally important. Too often, measurement requirements are enforced from the top down, with insufficient knowledge of pioneer firms' realities and constraints in collecting these metrics and, just as important, consideration of the value that such data will offer to the firm. This point was made often in our interviews with pioneer firm management. Any data initiative involves balancing the costs of collection and the perceived insights derived from metrics.

Fortunately, a growing number of initiatives and tools are available to make impact measurement both easier and more valuable to all stakeholders, creating a range of demonstrable examples showing what can be achieved. Acumen's Lean Data Initiative is one such example. It uses a range of mobile technologies and focuses on natural company or customer touch points while using a range of smart survey methods (including the Progress Out of Poverty Index used in the research for this study) to improve the efficiency and effectiveness of data collection.

Similarly, common business and customer metrics long used by some of the best-run corporations to evaluate and improve performance may also hold significant promise. A good example of such metrics is the Net Promoter Score℠ (NPS®), which measures the strength of customer loyalty and advocacy for a product, service or organization.[39]

We believe that the potential relevance and applicability of NPS in the context of agriculture pioneer firms, which rely so significantly on word of mouth among farmers to encourage broader adoption of their innovation, could be extremely significant. This simple metric, and the broader loyalty system built around it, helps firms identify the drivers of advocacy and detraction and pinpoint the product or service elements and business processes that need to be adjusted to earn deeper customer loyalty. The connection between customer loyalty for a firm's product or service and its impact on customers' livelihood is one that demands further study. There is significant opportunity to explore how NPS can be effectively applied to low-income customers and provide pioneer firms with a more useful tool to drive insight, improve performance and create impact.

It is important to approach innovation with decisive links to other aspects of the Repeatable Model: delineating the firm's core market, listening to customers and ensuring that innovations are consistent with the firm's values.

and how competitive value propositions compare. Ultimately, it provides the warning system to the pioneer firm if it is not optimally delivering on any of the Four A's and informs the necessary corrective actions or structural improvements.

Learning systems. Put in place a few clear performance indicators and a process for monitoring and acting on them to drive continuous improvement. Though this may seem simple, selecting metrics that reflect fundamental drivers of business performance and that enable effective decision making can, in practice, be quite challenging. In an effort to have ever greater visibility, companies can end up drowning in numbers, unable to separate the interesting from the imperative. The cascade of key metrics from the firm to the individual level ensures organizational alignment and provides the basis for rapid learning and adaptation.

Innovation. Pioneer firms must build the capability to anticipate and react to evolving customer needs, competitive threats and new market opportunities. Innovations can take many different forms: new product or service features, new delivery platforms, changes in pricing level or model or process improvements. Pioneer firms need to determine the resource and talent requirements, the necessary levels of investment and investment criteria, the governance model and the critical processes that are required to institutionalize the capacity for innovation. It is important to approach innovation with decisive links to other aspects of the Repeatable Model: delineating the firm's core market, listening to customers and ensuring that innovations are consistent with the firm's values.

4. Invest: Are you investing in talent and systems that will set you up for long-term growth?

Capital. Pioneer firms need to secure the optimal type(s) of capital at the right time to fund growth priorities. As written in *From Blueprint to Scale: The Case for Philanthropy in Impact Investing*, philanthropic capital plays a key role in filling the pioneer gap. Grants can be especially valuable in the Prepare stage to help new companies activate a new market, and they can also be successfully deployed to develop parts of the value chain—building the skill base in farmer communities, creating better routes to market, conducting research and development that can be used by the sector—that don't exist, given the underdeveloped state of a market. Similarly, a small but growing number of impact funds are increasingly willing to take on higher-risk investments that have a greater probability of delivering outsized social returns, even in cases where the financial upside may not be high enough for more mainstream providers of capital. Part of the complexity of moving from the Blueprint to Scale phases is managing multiple stakeholders' requirements and building the core capabilities and governance of the firm, along with the clear path to profitability that mainstream investors expect.

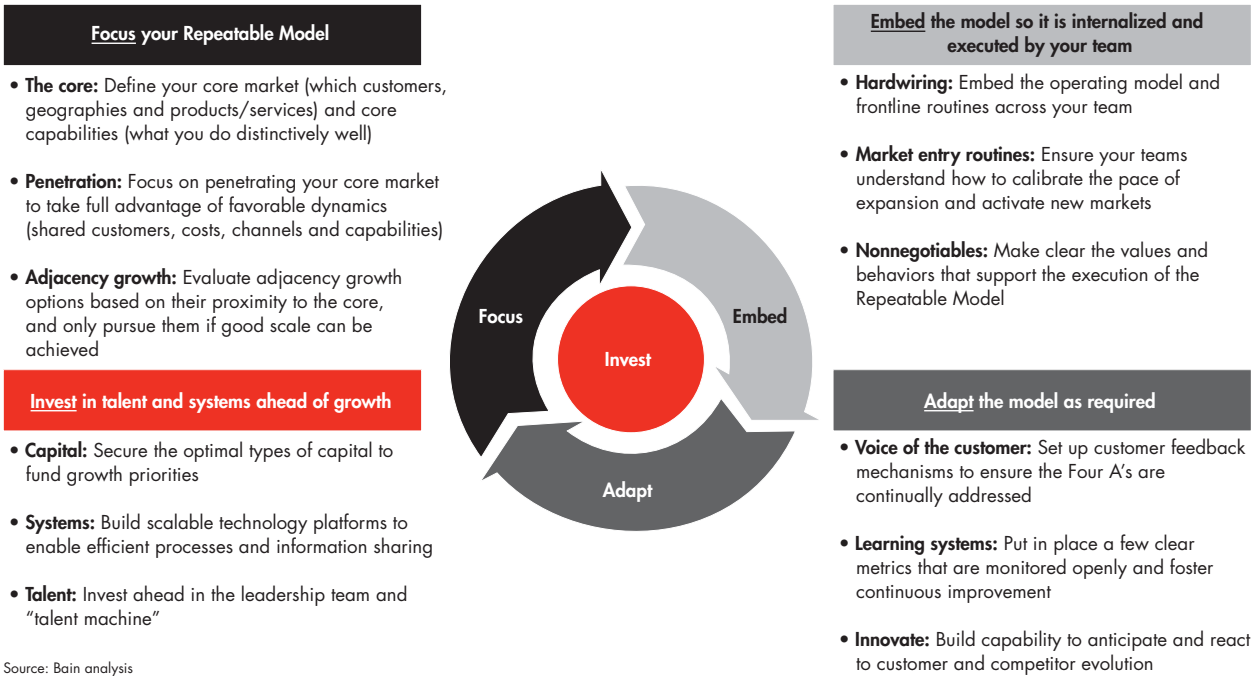
Systems. Build scalable technology platforms to enable efficient processes and information sharing. As is the case for any business, appropriate technology that is scalable and widely available can increase transparency and efficiency across an organization and drive faster, more informed decisions. Pioneer firms need to make sure that technology serves their purposes and is not overly complex or ill-suited to the conditions in which they work. Meeting these criteria can significantly enhance their efforts to reach more customers.

Talent. Invest ahead of growth in the leadership team and "talent machine." Scaling a pioneer firm can often require a different set of leaders than the initial founding team. Furthermore, such companies need ever more human capital, from senior executives to frontline employees, to run the operations day in and day out. Pioneer firms must invest ahead of revenue growth to attract the kind of talent that can help grow and sustain the company. Providing incentives like employee stock options can be one way to attract management personnel who may have years of experience at larger firms but, accordingly, larger salary expectations.

Admittedly, in many contexts, options may not work given the limited precedent for this form of incentive in this field. Furthermore, many more-senior employees may be hesitant to spend significant time in rural areas if they do not have prior experience there. Thus, many companies have to overinvest in finding senior personnel who are at the right career point to make a significant change and have a passion for contributing to the broader development of the country. For frontline employees, there must be an increasingly standardized and efficient system that is able to effectively screen and evaluate prospective employees, bring them into the organization and train them to quickly carry out the responsibilities for which they are hired. However, as pioneer firms expand and professionalize the organization, they must pay special attention to maintaining its unique culture and nonnegotiables.

In summary, Repeatable Models enable companies to reduce complexity, collapse the distance between CEO or founder and the front line, turn speed and adaptability into competitive advantages and build a solid foundation for rapid, sustainable growth. The Repeatable Model framework is a continuous process of appraisal and learning (*see Figure 17*). Taken as a whole, the framework provides pioneer firms with a guide to the key elements of their business that must be in place to achieve good scale. Few pioneer firms serving smallholder farmers excel at all elements.

Figure 17: Achieving widespread adoption requires developing and executing Repeatable Models



Source: Bain analysis

Repeatable Models enable companies to reduce complexity, collapse the distance between CEO or founder and the front line, turn speed and adaptability into competitive advantages and build a solid foundation for rapid, sustainable growth.

Following are detailed profiles of two organizations, Juhudi Kilimo and OAF, and a brief overview of Sidai. These profiles highlight the ways in which these businesses have developed aspects of Repeatable Models to build good scale.

Profile: Juhudi Kilimo

Juhudi Kilimo (meaning "agricultural efforts" in Swahili) was founded in 2004 as an agribusiness initiative within K-Rep Development Agency, an R&D-focused microfinance NGO. By 2009, it had become an independent for-profit social enterprise with the mission of providing loans and training to rural smallholder farmers.

Juhudi Kilimo provides asset-backed loans and basic finance and agriculture training to smallholder farmers. Unlike traditional microfinance, which primarily provides loans for working capital, Juhudi Kilimo finances specific agricultural assets that offer ongoing income for farmers, like a dairy cow or a motorcycle used to carry milk from a farm to a processing center. These assets are insured to protect both the clients and Juhudi Kilimo from business losses. The company reduces farmers' risk of further indebtedness by using the assets as a form of collateral in case of default. Each asset is verified to have been purchased by the customer within one month of the loan having been provided.

As with much microfinance around the world, groups of clients (typically groups of five) co-guarantee their loans and support one another through independent joint liability groups with oversight from Juhudi Kilimo's loan officers. Farmers in these groups meet to share ideas and encouragement, learn about new products and services and organize for access to better pricing and markets.

Focus

Juhudi Kilimo's strategy is grounded in a clearly articulated core market: providing financing for income-generating assets to smallholder farmers in Kenya (*see Figure 18*). It differentiates itself from other MFIs by focusing on asset-backed group loans and providing them at lower interest rates and "at the customer's doorstep," with faster processing and approval times and customer training to enhance productivity. These

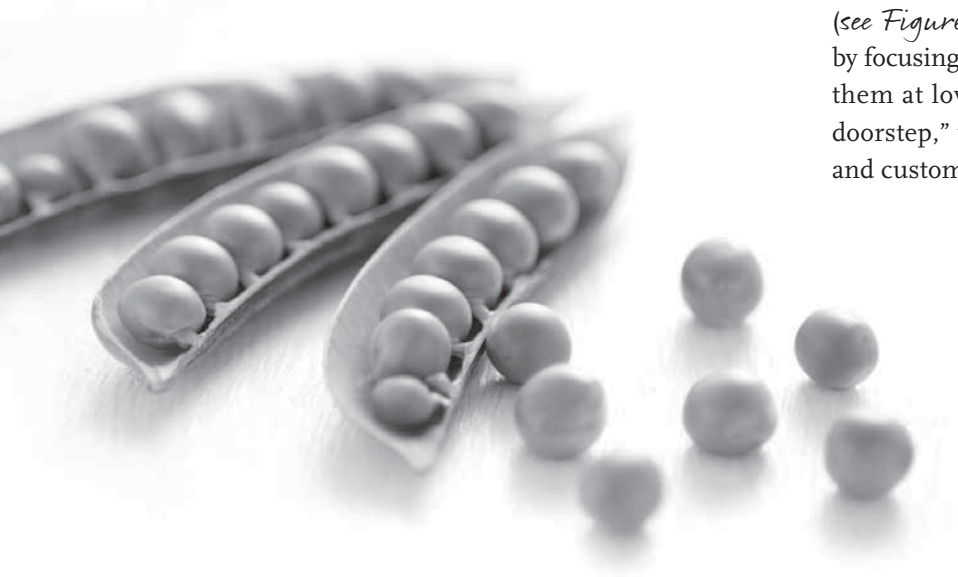
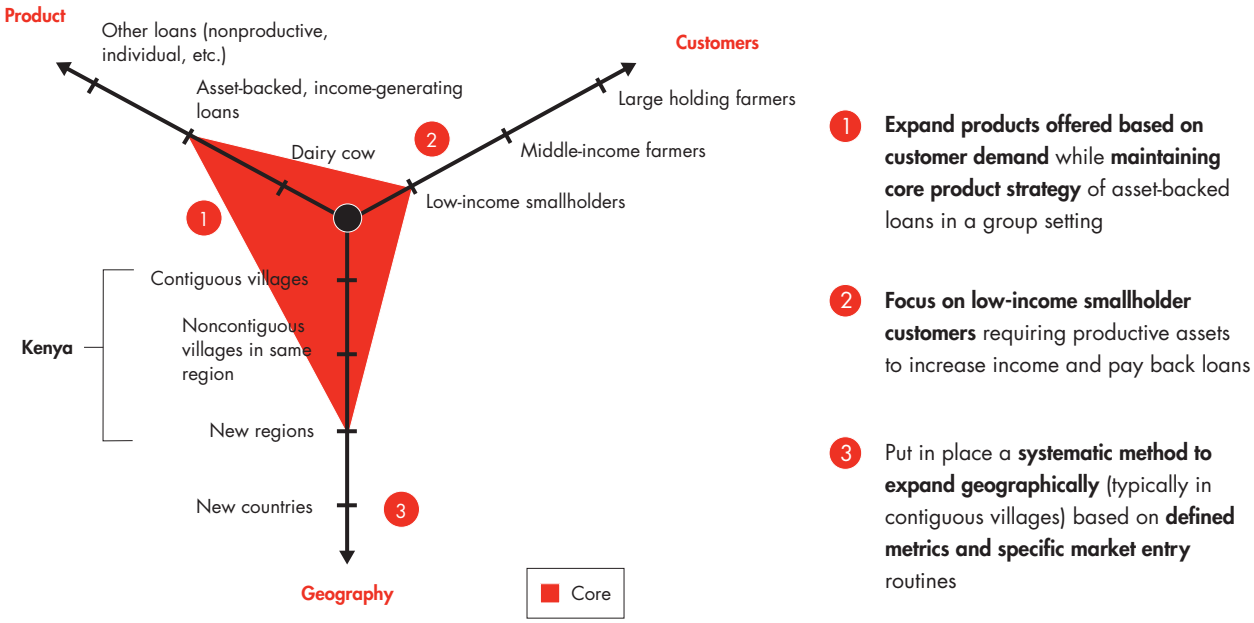


Figure 18: Juhudi Kilimo focused on asset-backed group loans for productive assets for farmers in Kenya



Sources: Interviews with Juhudi Kilimo management; Bain analysis

differentiators are enabled by Juhudi Kilimo's relatively low cost of capital (achieved by negotiating lending funds from low-cost providers like the microfinance platform Kiva) and by cloud-based management information systems and a productive workforce (which manage high customer loads while maintaining high repayment rates).

The company focuses on penetrating its core market to take full advantage of favorable market and competitive dynamics—that is, shared customers, costs, channels and capabilities. Once a branch is established, the company focuses on increasing penetration in that area based on key operating metrics. The branch must get to an outstanding portfolio of $450,000 with approximately 300 active customers per loan officer, four or five loan officers and a customer repayment rate of 98%.

The company has slowly expanded its product offerings based on customer research while maintaining its core product strategy of providing asset-backed loans to joint liability groups. Its original loan product was specifically for dairy cows. The milk provided ongoing income with which to repay the loan and increase the family's income. Seeing gaps in the value chain, such as in the transportation of milk from the farm to a processing center, the company expanded into a close product adjacency, providing loans to farmers who wanted to buy a motorcycle to transport their milk. Though customers have increasingly requested individual loans or loans for education or home expansion, Juhudi Kilimo has remained focused on providing loans only for assets that directly and quickly generate income. This decision minimizes potential product complexity and helps employees and customers develop a clear idea of what the business stands for and what value it brings.

Repeatable Models and microfinance

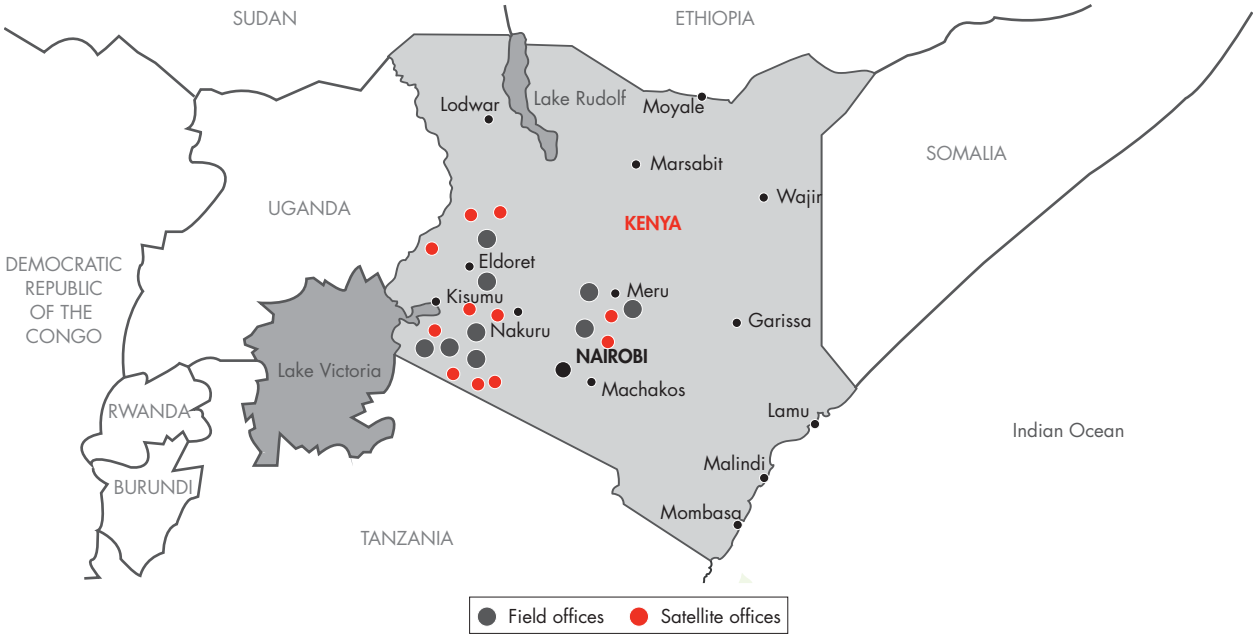
It is no surprise that, of the companies we studied, the two that had the most elements of the Repeatable Model framework in place were also involved in aspects of microfinance. The most widely and successfully scaled service tailored to low-income customers has been microfinance. There are many reasons for this, including the broad applicability of the service and the attractiveness of cash that is provided at a fraction of the interest rates offered by alternative lenders.

However, another reason is the significant investment by many organizations around the world to codify best practices for the business model. The Grameen Model that came out of the Grameen Bank in Bangladesh provided a prototype that has been implemented across dozens of countries over the past two decades. The overall organizational structure—from the head office to the branch office, the number of clients per loan officer and the general model for forming and facilitating joint liability groups—was well documented and shared around the world to help other organizations increase financial inclusion.

The Consultative Group to Assist the Poor, a "global partnership of 34 leading organizations that seek to advance financial inclusion," funds and supports research and publications on a range of topics related to customer segmentation, policy, mobile platforms and financial-inclusion product development. Organizations such as Accion International, Women's World Banking and the Foundation for International Community Assistance provide direct support and coordination across a network of MFIs. The similarity of each organization's fundamental model allows for valuable operational interventions that increase efficiency and effectiveness.

Given the diversity of local environmental conditions, the applicability and expected advantages differ for an agriculture company from place to place. The kind of operational best-practice sharing possible with microfinance is more challenging when it comes to seeds, fertilizer, drip irrigation or the artificial insemination of cows. However, there is significant opportunity to increase the level of codification and best-practice sharing across agriculture-focused companies. Studying and codifying best practices in other industry verticals, whether within agriculture or more broadly, support greater understanding of effective business models to serve the poor.

Figure 19: Juhudi Kilimo's market entry routines have led to a geographic focus in southwestern Kenya



Source: Juhudi Kilimo company data

Embed

To embed its business model across the organization, Juhudi Kilimo established a systematic, standardized recruiting system to ensure that hiring standards would be maintained as employee numbers increased. This system comprises clearly defined job descriptions, standardized application screening criteria used by recruiting agencies and final-round interviews with senior management at Juhudi Kilimo's headquarters.

Training at Juhudi Kilimo is extensive. New loan officers shadow seasoned officers for three months before taking on and growing a portfolio of their own clients. The HR department also published process manuals to disseminate best practices across the organization and created a mentoring program that matches each mentor to two employees. Finally, the company is in the process of establishing Juhudi Academy, which will offer a formalized training program for continuous learning to new and current employees. Once it is launched, the academy will use a defined syllabus and have a "train the trainer" emphasis as the company continues to grow.

Juhudi Kilimo uses a bottom-up approach to goal setting, guided by what the head office believes is achievable given access to capital and talent. Its overall goal of serving 100,000 customers by 2015 was defined in 2013 with input from all branch managers. The company sees itself as a collection of operating units and understands that its success is predicated on the ability of its individual loan officers to acquire and retain customers. To that end, it systematically tracks individual field officers' progress toward weekly and monthly goals.

In addition to defining metrics to measure penetration in existing markets, Juhudi Kilimo established a step-by-step expansion process for establishing satellite offices in new markets and, over time, developing them into branch offices. As a branch begins to reach performance levels that indicate it has achieved nearly optimal penetration (its "state of the core" metrics), Juhudi Kilimo's

marketing team evaluates branch managers' proposals for which new market to enter. These new markets must lie within 45 kilometers of an existing branch to ensure easy access by loan officers, who typically travel by motorcycle. Proposals contain estimates of demand, as well as assessments of basic infrastructure such as roadways and the general security of the area. A more detailed study follows to test the feasibility of opening the proposed new satellite. The team meets with stakeholders associated with the potential new location, conducting focus groups with smallholder farmers, understanding financial institutions' activities in the region, assessing the capacity of local dairies and meeting with government agencies to explain what Juhudi Kilimo does and how farmers benefit from its services. Figure 19 shows Juhudi Kilimo's current operational footprint.

One of the key elements the team assesses is the potential demand in the new market. Signs of potentially high demand include the presence of smallholder farmer clusters, gaps in sources of financing for these customers and existing government programs serving farmers (which could generate initial leads to already formed groups). The team also tests for the presence of support systems in the targeted location, such as sufficient basic infrastructure, sufficient purchasing capacity, value-chain support (including agrovets and breeders for dairy cows) and the potential to partner with ministries, cooperatives or other stakeholders. If a new site seems attractive, the team generates ideas for how to tailor marketing methods and products (such as whether the primary income-generating asset will be cows or poultry). These activities are all aimed at making sure that the drivers of adoption, the Four A's, are in place.

As CEO Nat Robinson explained, "When we started, we set up offices all over Kenya. A more organic approach is being used now, where current offices are used as the base from which satellite offices are created as demand increases."

The expansion process follows these steps:

1. **Create an initial proposal and conduct a feasibility study.** A branch manager's proposal to enter a new market is created and analyzed by the marketing team for feasibility and attractiveness.

2. **Build an initial portfolio and set up a satellite office.** A loan officer from the parent branch begins making trips to the new location and building a loan portfolio there. When the portfolio reaches $90,000 to $100,000, the satellite office is established.

3. **Activate the market.** Juhudi Kilimo activates the new market (i.e., raises awareness of its offerings) by broadcasting radio advertisements in local languages, during which current clients provide testimonials, branch employees describe the company's vision and products and listeners are invited to call in with questions. The company sends vehicles with the company's logo and loudspeakers to the area and sets up tents to hand out flyers and generate leads. In addition, the sales team, accompanied by a current client, walks from village to village to meet prospective customers. The Juhudi Kilimo team explains what the company has to offer and the client shares his or her personal experiences of working with Juhudi Kilimo.

4. **Establish a new branch.** When the satellite office's loan portfolio reaches $140,000 to $150,000, a branch office is established. Business development officers and administrative personnel (finance and information technology support) are added as needed.

By following these standardized expansion routines, Juhudi Kilimo has expanded to 20 branch offices across Kenya.

Adapt

Juhudi Kilimo has put learning systems in place to adapt its business model as required to continue increasing its scale. It collects and analyzes data on key metrics, such as loan amounts disbursed, the number of active borrowers, the number of new loans by type and portfolio quality (rate of client repayments). The company uses salesforce.com to collect the data in real time from tablet computers provided to every loan officer. Juhudi Kilimo reports performance on those metrics on weekly scorecards and discusses branch-level performance during weekly meetings led by the COO.

OAF invests in farmers to generate a permanent gain in farm income by distributing packages that can include seed and fertilizer, financing, agricultural training and market education.

Performance on key metrics is used to determine incentive pay for branch managers. Performance below goals is elevated to branch managers and then to area managers, with an emphasis on determining the root causes and tailoring coaching, training and other programs to improve performance.

To further support learning, Juhudi Kilimo uses a short message service (SMS) for mobile phones to survey current clients. The survey covers general satisfaction, the assets clients have acquired, how Juhudi Kilimo's services have affected their income and what help they might need to increase their productivity. Responding to these surveys is free for customers and costs Juhudi Kilimo just $0.40 per response. Juhudi Kilimo typically achieves a response rate exceeding 30% within two days of sending out the surveys. It uses the responses to identify any operational issues and to tailor the technical support it provides to farmers. Radio call-in shows further enable Juhudi Kilimo to gather questions and feedback from potential customers. The marketing department ensures that all questions are answered live on the air or are compiled and conveyed to the respective branches for discussion with joint liability groups.

Juhudi Kilimo also seeks to continually improve its approach. For instance, it created Juhudi Labs to test new product and process innovations, such as providing individual loans and other products (including dairy cooling units and warehousing) for the agricultural value chain. The branch managers also convene regularly to share best process and administrative practices across the organization. To explore potential new products that come with a higher risk level and longer payback periods, Juhudi Kilimo sources funding from grant-giving foundations.

Invest

Juhudi Kilimo invested early on in high-caliber, locally sourced leadership talent. Nat Robinson, the current CEO, made it a point from the outset to localize his senior team and brought in seasoned executives with significant relevant experience. For instance, Shadrack Mutunga, CFO, has worked for 14 years in the microfinance industry, including stints with Kenya Women Microfinance Bank, Remu DTB and World Relief. Nancy Butama, chief human resource officer, has more than 10 years' experience in healthcare insurance, including managing an HR department for more than 450 employees. Benjamin Kimosop, COO, has extensive experience within Juhudi Kilimo, having been promoted from business development officer to branch manager to regional manager before he became COO. He was formerly an area manager with SISDO, a larger Kenyan MFI. And Mujeni Aseli, chief marketing officer, previously worked as a senior brand manager with the Coca-Cola Company across countries in southern Africa.

To manage high client loads and repayment rates, Juhudi Kilimo maximized staff efficiency by adopting a cloud-based management information system to support quick processing and reporting of only a few days. This scalable IT system helped ensure efficient tracking of critical performance metrics. The system was designed to accommodate a five-year strategy and to expand to cover as many as one million users. One platform runs core operations and the other is used to manage leads generated from various sources. Members of the IT team visit each branch monthly to diagnose and fix any problems.

Juhudi Kilimo's loan disbursements grew from just $1 million in 2009 to $6.3 million in 2013. Meanwhile,

the number of smallholder farmers it served expanded from almost 4,800 in 2011 to nearly 14,500 in 2013, a 202% increase. From 2011 through 2013, the number of employees more than doubled from 43 to 98. Impressively, from opening roughly one branch office a year since 2004, Juhudi Kilimo opened four branch offices in 2013. At the time of writing, Juhudi Kilimo is expecting significant growth in 2014 and is on track to add seven branch offices within the year (*see Figure 20*).

Profile: One Acre Fund

One Acre Fund is a nonprofit based in East Africa that supplies smallholder farmers with a complete bundle of financing and training services to reduce hunger and poverty. The organization invests in farmers to generate a permanent gain in farm income by distributing packages that can include seed and fertilizer (depending on the country), financing for these farm inputs, agricultural training and market education to maximize harvest profits. OAF operates in villages throughout Kenya, Rwanda, Burundi and Tanzania and delivers services within walking distance (generally less than five kilometers) of the 180,000 smallholder farmers it serves.

The organization facilitates activities and transactions at each part of the farming value chain, from seed sourcing to education on selling output. On average, member farmers realize a 100% return on their investment and significantly increase farm income on every planted acre.

OAF has mastered many elements of the four-step process for building and deploying a Repeatable Model.[40]

Focus

OAF's core offering is to provide agricultural inputs on credit to within walking distance of low-income smallholder farmers (*see Figure 21*). The company holds weekly training sessions with its farmers to ensure they are using optimal growing techniques to get the most from the inputs. To reduce complexity,

Figure 20: With greater efficiency increasing its loan book, Juhudi Kilimo is now embarking upon a significant growth phase

Source: Juhudi Kilimo company data

Photo credit: One Acre Fund

its loan packages are standardized across each country where it operates. Thus, the core concept of its offering remains the same, even if each market's package may have minor modifications, such as the types of seeds or fertilizers.

The organization differentiates its product offering by always delivering high-quality inputs in time for the planting season and by providing in-person training that helps farmers use the inputs correctly to increase their productivity. To ensure the quality of inputs, the organization takes delivery directly from manufacturers and deploys a stringent quality-control process. It also ensures delivery of inputs to farmers no later than a few weeks before planting season begins. The groups of 10 to 20 farmers meet weekly with a field officer, who teaches effective farming practices.

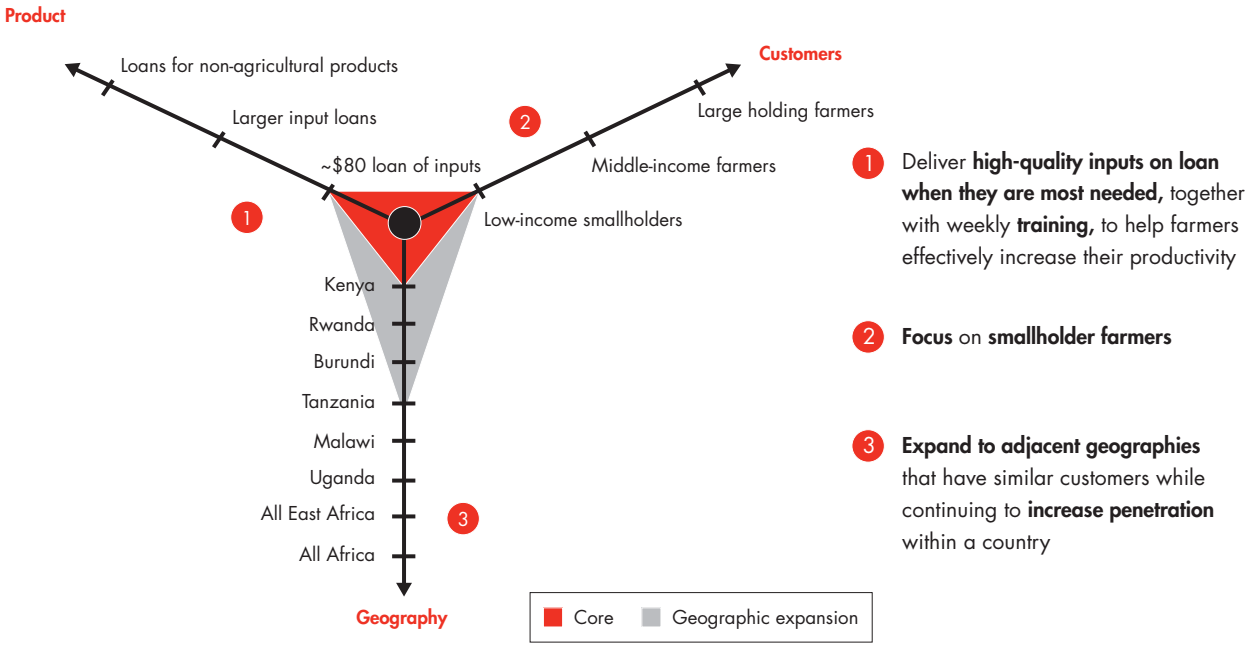
OAF has expanded to adjacent geographies that have similar customers in terms of their income, growing techniques and plot sizes, while deepening its penetration into its original market of western Kenya.

Embed

To hardwire its Repeatable Model across the organization, OAF has built systems aimed at managing complexity. It rigorously monitors performance across a number of metrics (key performance indicators, or KPIs) that have been grouped into three categories central to OAF's mission: impact, scale and sustainability. All major business decisions are evaluated through the lens of a decision's effect on these three categories. Field officers receive weekly updates on the performance of their loan portfolio and the repayment amounts and rates pertinent to the farmers they represent.

OAF has further controlled complexity by standardizing people management and operations. To illustrate, in each country where OAF operates, field-officer recruiting is standardized, including criteria for selecting new hires and the use of templates for screening job candidates. Newly recruited field officers go through a comprehensive, four-week training program supported by a detailed, 110-page crop-training manual that OAF

Figure 21: OAF focuses on providing a package of inputs with financing to smallholder farmers in East Africa



Sources: Interviews with One Acre Fund management; Bain analysis


Photo credit: One Acre Fund


Photo credit: One Acre Fund

updates frequently to reflect newly learned best practices from the field (*see Figure 22*). The program covers OAF's vision, mission and organization and includes job shadowing with more experienced field officers. Participants learn key elements of crop training, such as how to lead meetings and how to teach land preparation, planting monitoring, weeding, top dressing and pest and disease control. Field officers in training are given memorable takeaways, reference cards, for example, with illustrated planting instructions that they can use in consultations with customers.

A central procurement organization purchases inputs directly from suppliers, and all purchases go through a rigorous quality inspection. OAF's logistics team plans three-week delivery periods more than 10 months in advance.

In Kenya, OAF has become similarly disciplined regarding market entry. Previously, OAF created "islands" away from its geographic center and expanded from those hubs. Today, it expands to areas contiguous to its current operations, splitting districts in half when necessary to meet its scale goals. This new, contiguous expansion approach has dramatically reduced OAF's distribution costs. Moreover, it has eliminated the need to relocate field officers to areas with which they are not familiar. Officers can use word-of-mouth publicity and customer advocacy from nearby communities where OAF has achieved penetration. And because the contiguous markets are well understood and tested, risks and learning costs have been minimized.

In terms of its international expansion, OAF has a codified methodology that starts with secondary research of a potential target country, with an eye toward identifying opportunities to make a positive impact on smallholder farmers' income. Impact checklist items include small farms, staple crops with established markets, low yields and low use of fertilizers and improved seeds. Operations checklist items include security risk, one million to two million serviceable households, low prevalence of corruption and sufficient infrastructure to support operations and growth.

Conversations with OAF's cofounder Andrew Youn reveal that the idea of focusing on penetration before expansion was a key part of the organization's early years. "We thought about growth in the way that retail companies do," Youn said. "We could grow our sales at existing 'stores' or we could build new 'stores.'" OAF focused much of its early refinement of the model in Kenya on developing the metrics that would indicate

Photo credit: One Acre Fund

whether the firm had sufficiently grown its existing operations before expanding to new areas. The organization now has a clear hierarchy of growth: first "growing in" by increasing client density within existing areas, then "growing out" with new areas within a current country operation and, finally, new country expansion. Operational resources are allocated according to this prioritization.

OAF also conducts primary research on customers to understand the needs of specific farming communities in target regions. Questions include whether farmers see the value of OAF's offerings, whether they are willing and able to pay on time and whether OAF's methods could lead to higher yields for the farmers.

The organization typically has two to three countries in a trial phase, with the goal of expanding into a new country in Africa every 18 months. From its roots in Kenya in 2006, it entered Rwanda in 2007, Burundi (which borders Rwanda) in 2012 and Tanzania (which shares borders with Kenya) in 2013. It is currently piloting a project to explore the potential of expanding in Malawi and Uganda.

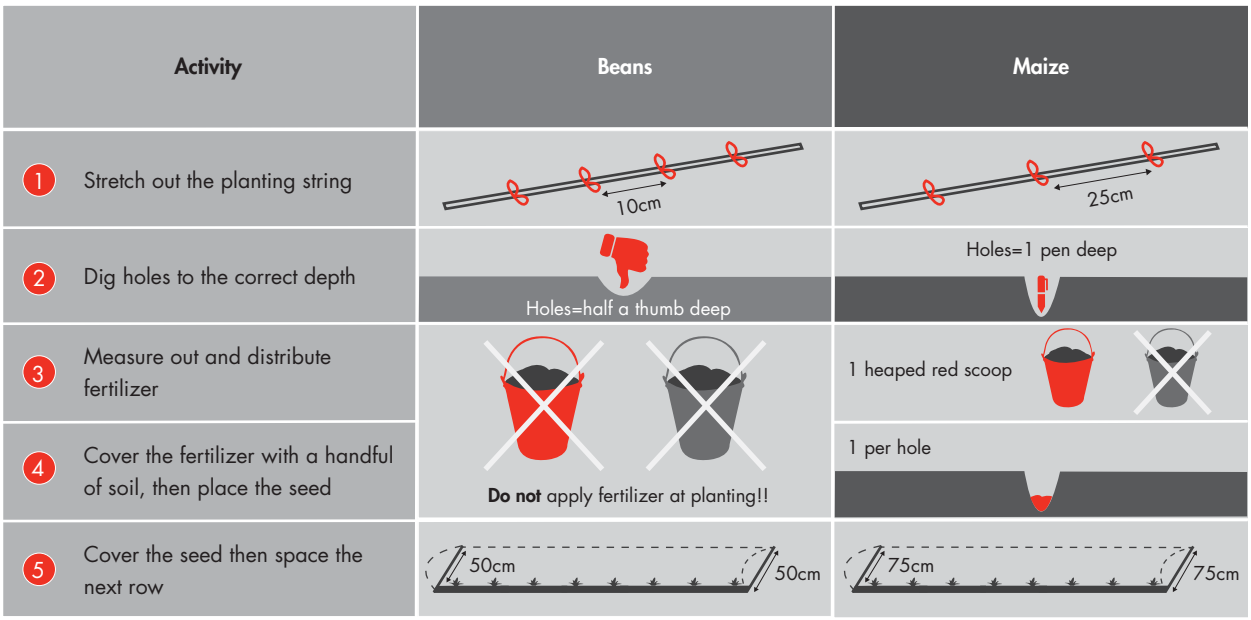
To further embed its Repeatable Model throughout the organization, OAF has established nonnegotiables for its people that include putting the "farmer first" in everything it does (*see Figure 23*). The organization makes it clear that the farmer is the boss—the customer that every field officer must listen to.

Adapt

Adapting OAF's model starts with rigorous tracking of the KPIs that the organization has defined for its more than 2,000 field officers. These include metrics related to policy adherence—such as meeting attendance and number of members who have used OAF inputs; agriculture knowledge, such as planting- and topsoil-quiz scores; repayment rates, including collections to date and weekly collections; and logistics, such as distances that members have traveled to pick up inputs. OAF tracks these on a weekly basis, conducts annual customer satisfaction surveys and gathers data on satisfaction from customer call centers. The organization uses these data to make decisions about promotions, incentives and, when necessary, terminations of low performers. These metrics also shape how the company allocates its resources and responds to changing customer dynamics and growing conditions.

Performance on KPIs is completely transparent to field officers. As Kiette Tucker, director of operations for Kenya, put it, "Tracking metrics is crucial to our business; field officers can recite their recent KPIs."

Figure 22: Example of training materials that field officers use to remind themselves of optimal operations, which are then passed on to farmers in weekly training sessions



Sources: OAF blog; interviews with One Acre Fund management; OAF 2014 crop training manual

OAF invests heavily in learning and innovation. It uses a customer data-driven approach to continually refine its core product and inform decisions about innovation. Every year, it surveys several customers per field officer and conducts a text-based survey of its customers to understand usage patterns and how it could improve its services. The organization maintains a dedicated innovation team supported by an $11.6 million grant from the Bill & Melinda Gates Foundation. Across its operations, OAF is currently testing 40 high-potential technologies, with the goal of rolling out four of the most promising to as many as 200,000 farmers. Prospective innovations may take the form of seed sample packs and new varieties of particular crops, as well as new services like funeral and drought insurance. Every innovation goes through a rigorous, multiphase trial process. "We have eight bean varieties and eight maize varieties we are working with, and we hope in the following seasons we will be delivering [new] seeds to farmers ... We are strengthening our ongoing experiments in storage, using bags to avoid post-harvest losses ... and in composting by encouraging our farmers to not only use chemical fertilizers but to mix it with organic fertilizer, too," explains Emmanuel Habineza, director of innovations for Rwanda.[41]

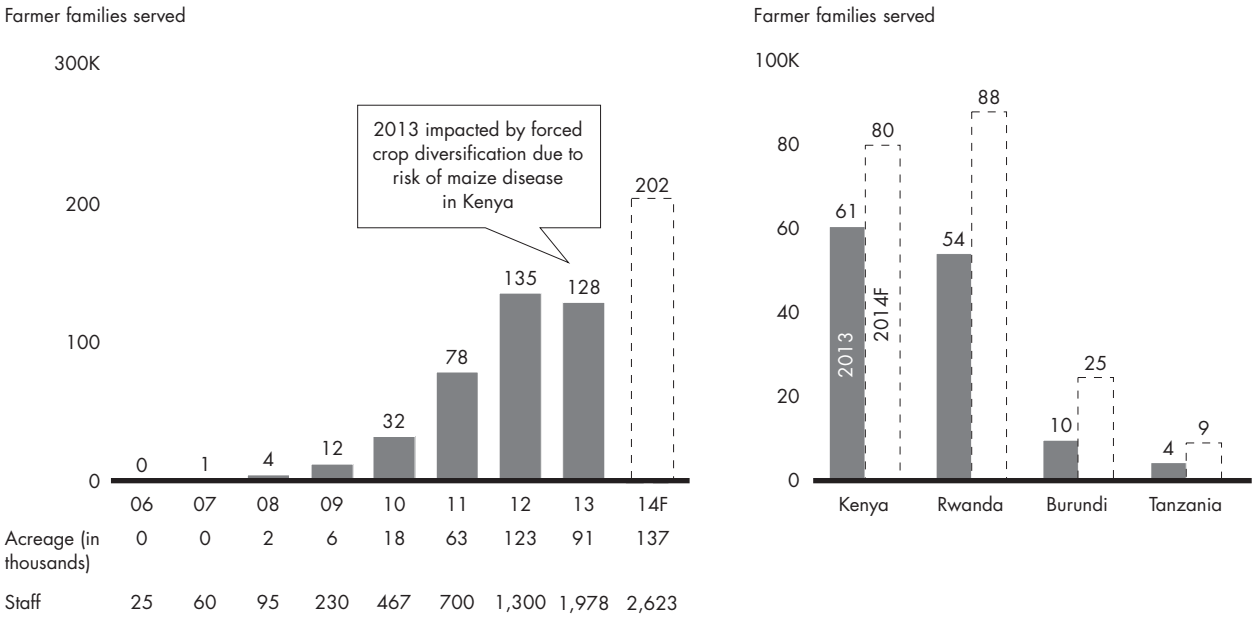
The ability to adapt its model was crucial to the organization's survival in Kenya in 2013. Previously, OAF had predominantly provided maize seeds to farmers in Kenya. At the end of the 2012 season, however, farmers began seeing their maize wilt and die in the field. After an international research effort, the cause of the blight

Figure 23: OAF's mission statement puts farmers first in all that it does, supported by specific values

Farmers first	
	Purpose: We serve small-scale farmers. In everything we do, we place the farmer first. We measure success in our ability to make more farmers more prosperous.
Values	
1	**Humble service:** We meet farmers in their fields and we get our shoes muddy. Farmers are our customers, and we serve them with humility.
2	**Hard work:** We work hard every day. We execute with world-class professionalism and business excellence. Farmers deserve nothing less.
3	**Continual growth:** We improve every season. We work with determination to meet our goals and then stretch ourselves by raising the bar even higher.
4	**Family of leaders:** We bring together the best leaders and build long-term careers. We care for team members like family
5	**Dreaming big:** We envision serving millions of farm families. We build for scale with every idea and solution.
6	**Integrity:** We do what we say, and our words match our values.

Source: One Acre Fund website

Figure 24: OAF has a strong Repeatable Model and will reach more than 200,000 farmers by the end of 2014



Source: One Acre Fund data

How Sidai is building its network of livestock service centers

Sidai operates livestock service centers—both company owned and franchises—in Kenya. The centers sell livestock inputs (including vaccines and feeds) as well as crop inputs (fertilizers and seeds). The centers' veterinarians and animal-health technicians also visit farms, providing services to ensure that farmers make good use of these inputs. Founded in 2011, the firm has already opened six company-owned locations and 70 franchised centers. It hopes to grow this network to at least 150 service centers by 2015.

The company's use of a modern retail format for its service centers lies at the core of its Repeatable Model of delivering quality products and services. The format gives shoppers open access to products on shelves, and well-informed sales staff can assist them in making the right selections.

Sidai enters markets that lack adequate livestock services by setting up a company-owned store and then expands by opening franchises in the contiguous region. The company-owned stores are hubs for the network of franchised locations, serving as warehouses and sourcing centers. The company's locations are also centers of expertise that provide technical advice and training for franchisees. To ensure the lowest cost for products sold by franchisees, the company takes advantage of the network's size to obtain products from major suppliers. As Anthony Wainaina, the company's managing director,

(Continued)

explains: "There is demand for Sidai's services all over Kenya. We open franchises based on where the costs can be managed, particularly distribution." As the founder and chairman, Christie Peacock, noted, "We want to make money and serve livestock keepers in underserved locations and so open in some prime locations close to milk collection hubs. However, we also operate in remote parts of the far north of Kenya where there are thousands of livestock receiving no regular attention."

Recognizing that its network is only as strong as its franchisees, Sidai "hardwires" its value proposition into the organization through a disciplined franchisee-selection process. The company identifies prospects in targeted markets and conducts due diligence on the promising candidates. Specific selection criteria include references from farmers, suppliers, banks and community leaders, as well as high performance in a previous trading business and genuine interest in working with farmers. Franchisees seeking to start their first business must produce a basic written business plan and have access to at least 20% of the required start-up capital. Short-listed applicants are interviewed directly by the company's managing director and chairman.

When entering a market, Sidai uses a standard set of methods to build its brand and promote awareness. Local radio ads introduce and reinforce the firm's quality and service promise and tell listeners

(Continued on page 100)

(Continued)

where to find the nearest store. The firm uses "field days" to showcase new products and provide basic training for franchisees, and it conducts seminars to train selected farmers on specific agricultural practices. It also forms partnerships with NGOs and suppliers to further expand its outreach.

Balancing regional needs and centralized quality standards is critical to the model's success. Sidai uses franchisees' feedback to tailor its product offerings to each region's geography, crops, soil and types of livestock. At the same time, it also applies centralized quality standards to ensure that manufacturers provide high-quality products. "We reach customers through the franchisees who tell us the products customers ask for, but everything in the store must conform to our quality standards," explains Peacock.

To enable this model to deliver results across its expanding network, Sidai has invested in building a management team and board with deep experience in business as well as livestock services. For example, its operations director is a veterinarian with experience in marketing and sales of veterinary pharmaceuticals and crop inputs in Kenya and other regions in eastern Africa.

As Sidai looks to the future, it will continue to build its hub-and-spoke model with company-owned stores supporting up to 20 to 30 franchises in densely populated regions. The aim is to first cover as much of Kenya as possible and then move into adjacent markets in other countries once it has carefully assessed the demand and its ability to operate successfully.

was identified as a new, rapidly spreading maize disease. Owing to the risk of planting maize in 2013, OAF decided to offer farmers a diversified package that included millet, sorghum, sweet potatoes, beans and cassava. But maize is an extremely popular crop in Kenya and some farmers decided not to work with OAF because they did not want to plant different crops. Changing the package reduced OAF's planned scale for 2013, but the firm was still able to reach 60,500 families in Kenya, and the loan package allowed those farmers to mitigate the risk of the maize disease. Across western Kenya, OAF farmers reported strong millet and sorghum harvests.[42]

Results

OAF's rigorous attention to building and executing a Repeatable Model has led to promising results (*see Figure 24*). In just four years—2009 to 2013—the number of farmer families the organization served grew tenfold, from 12,000 to nearly 130,000. The number of acres cultivated with its products increased from 6,000 to 91,000 during the same period. OAF is on track to reach a total of 200,000 farmers by the end of 2014 and to have 137,000 acres under cultivation. The organization has achieved particularly notable scale in Kenya (61,000 customers) and Rwanda (54,000 customers) and has gained significant traction in Burundi and Tanzania. Due to its continuous learning process, OAF has been able to achieve scale more quickly in each new market it enters (*see Figure 25*).

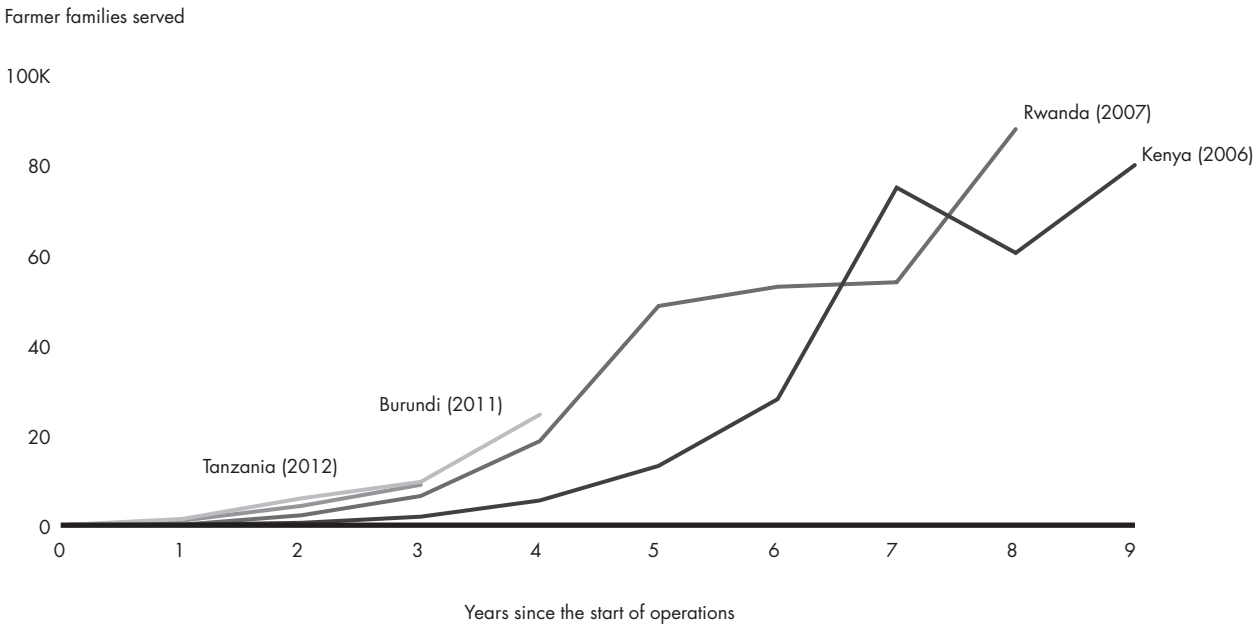
Learning loops in practice

It may seem that the path to building a Repeatable Model has been a straightforward one for Juhudi Kilimo, OAF and Sidai (see sidebar on page 98), but nothing could be further from the truth. Each of these businesses has figured out how to build Repeatable Models only by failing often—but failing smart. The key is in the iterative learning loops: to fail, to diagnose why the failure occurred, to modify the model as required and to start again. GEWP is in the process of doing this now.

In 2008, Juhudi Kilimo closed two offices. These offices were serving a region that was surrounded by two national parks; there, the farmers were not as familiar with the microfinance model, and dairy farming was less common than elsewhere. One of the branches had numerous issues with fraud, as well as a management team that was unable to hire and retain the required frontline staff. Both of these experiences taught Juhudi Kilimo key lessons that shaped its Repeatable Model. The first branch closing showed the firm the importance of conducting due diligence on a region to assess the size of the addressable market; Juhudi Kilimo's standardized market entry assessment tool was expanded, in part, as a result of this particular branch failure. The second branch failure emphasized the importance of strong middle management. Soon after, Juhudi Kilimo started investing in its HR efforts to more effectively identify, recruit, train and mentor branch managers who perform well and align to the firm's values.

As Stephanie Hanson of OAF said, "Everything we have gotten right is a result of getting it wrong first." In 2010, OAF had a pilot in southern Ghana. The firm soon found that the farmers there were not interested

Figure 25: With each new country it enters, OAF is achieving scale more quickly



Source: One Acre Fund data

in growing maize, OAF's focus crop. OAF then moved to the north of the country, home to more maize farmers, but realized that the market was simply too small. The OAF management then decided to stop its Ghanaian operations entirely so that they could devote more attention to markets promising the critical mass of farmers required to justify investment in the distribution network. The Ghana experience taught OAF how to better assess a market and quantify its potential. Importantly, the firm took the time to reflect on what did and did not work and shared these lessons and how they informed their operating model and expansion strategy with all of the senior team.

GEWP has realized that it must approach its expansion much more deliberately. Indeed, entering a new state is like entering a new country. As a result, GEWP has retrenched to Maharashtra and Karnataka, where it retains good name recognition, a solid network of more than 135 dealers and over 180,000 existing customers. It is focusing on Karnataka, because the desperate water shortage there means that many farmers must use drip irrigation to continue their operations. In each market, it is now focused on expanding a Repeatable Model more slowly but also more thoughtfully. To reap greater benefits from scale economies, it is now seeking the capital to own the manufacturing of KB Drip tapes.

One of the key lessons of building Repeatable Models is that it takes time and requires (and sometimes tests) the patience of those who work with, invest in and

A checklist: Repeatable Models

The questions below will help to facilitate the application of the ideas and principles outlined in this brief, and guide pioneer firms in building and executing Repeatable Models.

Focus

- ☐ When was the last time that you had a deep discussion about your "core" with your team? How certain are you that your management team and front line can articulate your core?
- ☐ What makes your company uniquely differentiated, now and in the future?
  - Measurable
  - Tangible
  - Decisive advantage
- ☐ How do you measure your penetration of your core market?
- ☐ What systems and processes do you have in place to assess adjacency growth?
- ☐ Are you seeing the costs and risks of complexity? How are you managing these?

Embed

- ☐ What are the few most critical frontline routines that really drive strategy and your differentiation? How thoroughly have your frontline employees adopted these routines?
- ☐ Do you have key metrics in place that tell you and your employees how well they are delivering against the strategy?
- ☐ Do you have metrics in place that signify whether and when you should consider growing to a new area?
- ☐ What are your market entry routines?

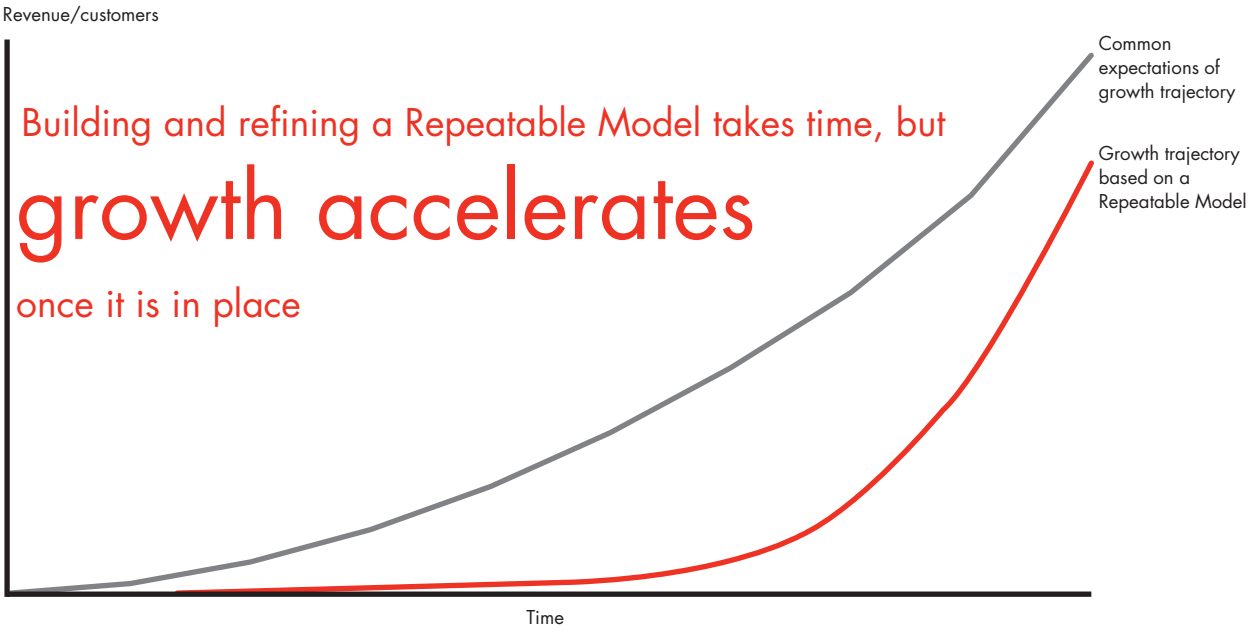
Adapt

- ☐ How much time is lost between decisions, actions and market feedback?
- ☐ Do you have learning systems in place that take into account regular input from customers and the front line?
- ☐ Do you have systems to step back and address the biggest threats to your current model?
- ☐ Have you set up clear structures and processes to continually innovate and capitalize on emerging growth opportunities?

Invest

- ☐ Do you have a financing strategy that considers the types of capital available to, and required by, your organization at different stages of its growth?
- ☐ Is the technology your business is using enabling or defining it (i.e., are technology solutions designed around your processes, or vice versa)? How scalable are your technology platforms?
- ☐ Do you have the right leadership in all parts of your business? How strong is your middle-management "bench depth?" How are you attracting, developing and retaining top talent across your business?

Figure 26: An illustration of the "expectation gap" in firm growth trajectory



Source: Bain & Company

support pioneer firms. Particularly in the agricultural context, given the diversity of growing conditions, variety of crops and unpredictability of Mother Nature, it can take years to figure out what works and what doesn't, how to customize the value proposition and how to best harness the Four A's to spur adoption. It is this deliberate period of developing, testing and refining the model that can allow for explosive growth once the Repeatable Model is in place (*see Figure 26*).

33 Harvey Koh, Ashish Karamchandani, Robert Katz, *From Blueprint to Scale: The Case for Philanthropy in Impact Investing*, Mumbai: Monitor Inclusive Markets/Acumen, 2012.

34 The addressable market is defined as nonsubsistence smallholder farmers in areas with a flat terrain and an accessible water source.

35 Chris Zook, "Desperately Seeking Simplicity," hbr.org., February 2012, http://blogs.hbr.org/2012/02/desperately-seeking-simplicity/.

36 Chris Zook and James Allen, "The Great Repeatable Business Model," *Harvard Business Review*, November 2011.

37 Chris Zook and James Allen, "The Great Repeatable Business Model," *Harvard Business Review*, November 2011.

38 Any real or perceived business behavior that takes advantage of the poor can have significant consequences for the industry, as the Indian microfinance industry saw in 2010. Based on accusations of unfair and predatory lending practices resulting in farmer suicides in the state of Andhra Pradesh, the state government made the distribution and collection of loans at peoples' homes illegal, halting the significant industry growth that had been experienced in the past 10 years. For more, see Vijay Mahajan and T. Navin, *Microfinance in India: Lessons from the Andhra Crisis*, Heidelberg: Springer Berlin Heidelberg, 2013.

39 Bain research has shown that the best measurement of customer loyalty comes from the answer to a simple question: "How likely are you to recommend [my product, service or company] to a friend or family member?" This question probes both dimensions of loyalty: the "head" (e.g., best features, best service, best price) and the "heart" (e.g., they know me, they value me, they listen to me, they share my values) and is often the strongest predictor of actual customer behavior. Promoters consume more of the product or service, stay longer as customers, make more referrals and complain less. As a result, companies with more promoters and higher NPS are often able to outperform their competitors in profitable growth.

40 We have focused on OAF's Kenyan operations throughout but aimed to provide information on regional differences where appropriate.

41 See "Catching Up on Innovations in Rwanda," One Acre Fund blog webpage, http://www.oneacrefund.org/blogs/tag/rwanda/80/P16.

42 Text adapted from OAF's 2013 Annual Performance Report. See http://www.oneacrefund.org/uploads/all-files/One_Acre_Fund_Annual_Performance_Report_2013.pdf for more details.

Photo credit: One Acre Fund

5.

Market systems: Implications for other actors

This chapter takes a broader view of the agricultural market system and how it affects adoption and firms' successes. We consider how the system may affect the performance of the Four A's, in addition to the ease with which a firm implements and scales its business model. We outline the specific actions that corporations, foundations and development agencies, investors, NGOs and governments can take to support both the firms that provide the solutions and the farmers they benefit.

"For markets to work better for poor people, they need to facilitate the access of the poor to assets, and enable them to use these assets to generate livelihood and to reduce vulnerability."

—*Making Markets Work Better for the Poor*
Department for International Development, 2000

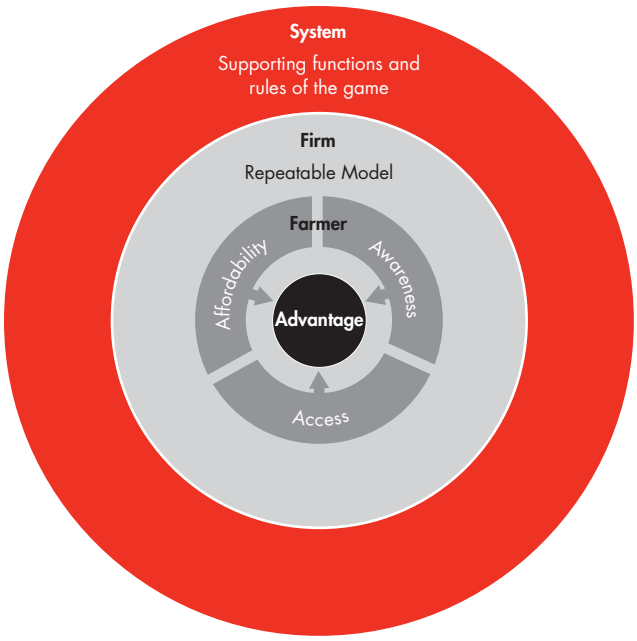
Market systems: Implications for other actors

So far, we have described the factors that motivate adoption from the perspective of smallholder farmers, and we have explained how the Four A's framework and Repeatable Models can help pioneer firms systematically achieve good scale and sustained adoption. We highlighted the importance of working across the value chain to enable farmers to realize the full benefits of new innovations. In this chapter, our goal is to place our analysis of the firm, and its interactions with farmers, in a broader systems context and to highlight the important interplay among pioneer firms, the market system and major systems actors, including large corporations, foundations and development agencies, impact investors, NGOs and governments.

Firms and farmers do not operate in isolation but within a wider market system. This system can either promote the Four A's and enable the firm to develop its Repeatable Model or it can hinder the firm's success and slow down adoption. Indeed, due to their innovative and first-moving nature, pioneer firms are often disrupting part of a failing system. In so doing, they have the potential to initiate broader systemic change. Conversely, in some cases, no matter how successful the actions of individual pioneer firms, the widespread adoption of an innovation may be undermined by the structural challenges in the larger system in which the firm operates.

We would not attempt, in a single chapter, to do justice to the full complexity of how an agricultural market system affects the likelihood of success of pioneer firms; however, we do indicate how and where the adoption of innovation is influenced by market systems and highlight steps that those within the system can take

Figure 27: The wider market system, with a range of supporting functions and rules, has significant bearing on the adoption of innovations



Source: Adapted from "Perspectives on the Making Markets Work for the Poor (M4P) Approach," SDC and DFID, October 2008

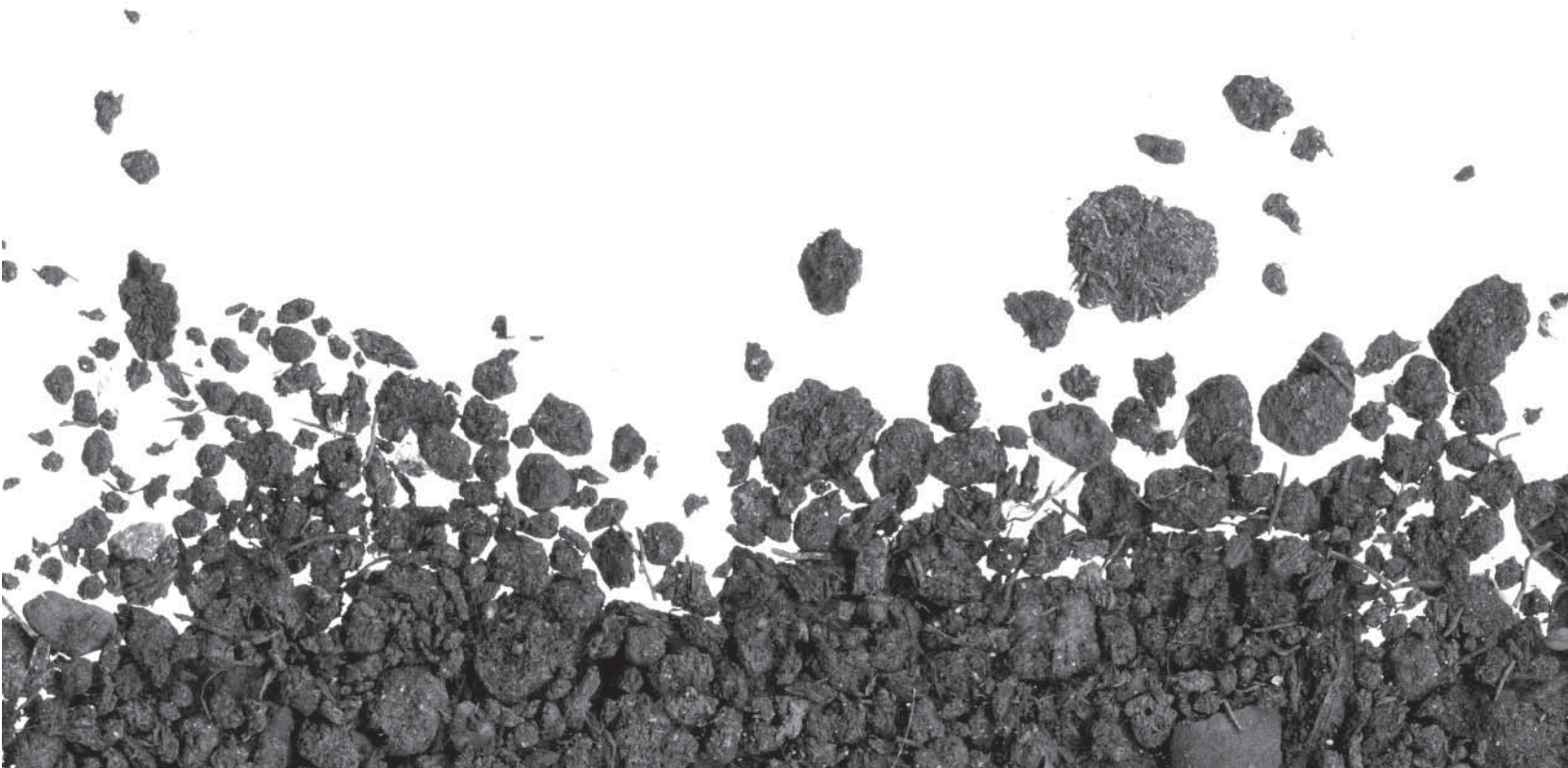
to increase the probability of a pioneer firm's success. Moreover, as a pioneer firm grows and begins to reach scale, its interactions with this system and other key participants within the system (including competitors), will become more central to the firm's success. Therefore, how players outside the pioneer firm act will have an increasing influence on the long-term success of these firms and on their ability to grow to serve millions of smallholder farmers.

The agricultural market system

A system is everything that mediates interactions within a market. For the purposes of this chapter, think of an agricultural market system[43] as the full range of supporting functions (such as land rights and access to personnel or finance) and both formal and informal rules of the game (like standards, regulations and laws) that impact the interactions between smallholder farmers and pioneer firms. The pioneer firm, its customers, as well as large corporations, foundations and development agencies, impact investors, NGOs and governments are all actors within the system (*see Figure 27*). It is how these players act that defines, and can ultimately transform, a system.

For example, trust is a major system element at the heart of every successful interaction between farmers and pioneer firms. An individual firm can enhance trust over time by the way it interacts with customers—and well-functioning standards bodies, labeling rules, effective media and anti-counterfeiting efforts all impact the way trust is experienced in the marketplace for innovative goods and services for smallholder farmers.

Whenever and wherever a specific part of the system is damaged or broken, a market will suffer: Goods will not get to the marketplace without roads; farmers will not access information without a well-developed media infrastructure; high tariffs and non-tariff barriers will prevent or delay the arrival of key firm inputs; and the absence of patent laws to protect IP will cause firms to underinvest in R&D. Similarly, even the brightest entrepreneur with the boldest idea is unlikely to successfully run a firm at scale without access to a talented pool of managers. Such personnel may be lacking because of the poor performance of the subsystem for skills training and business education. In short, the system can have a significant impact on the Four A's—both the degree to which they present obstacles to farmer adoption and the



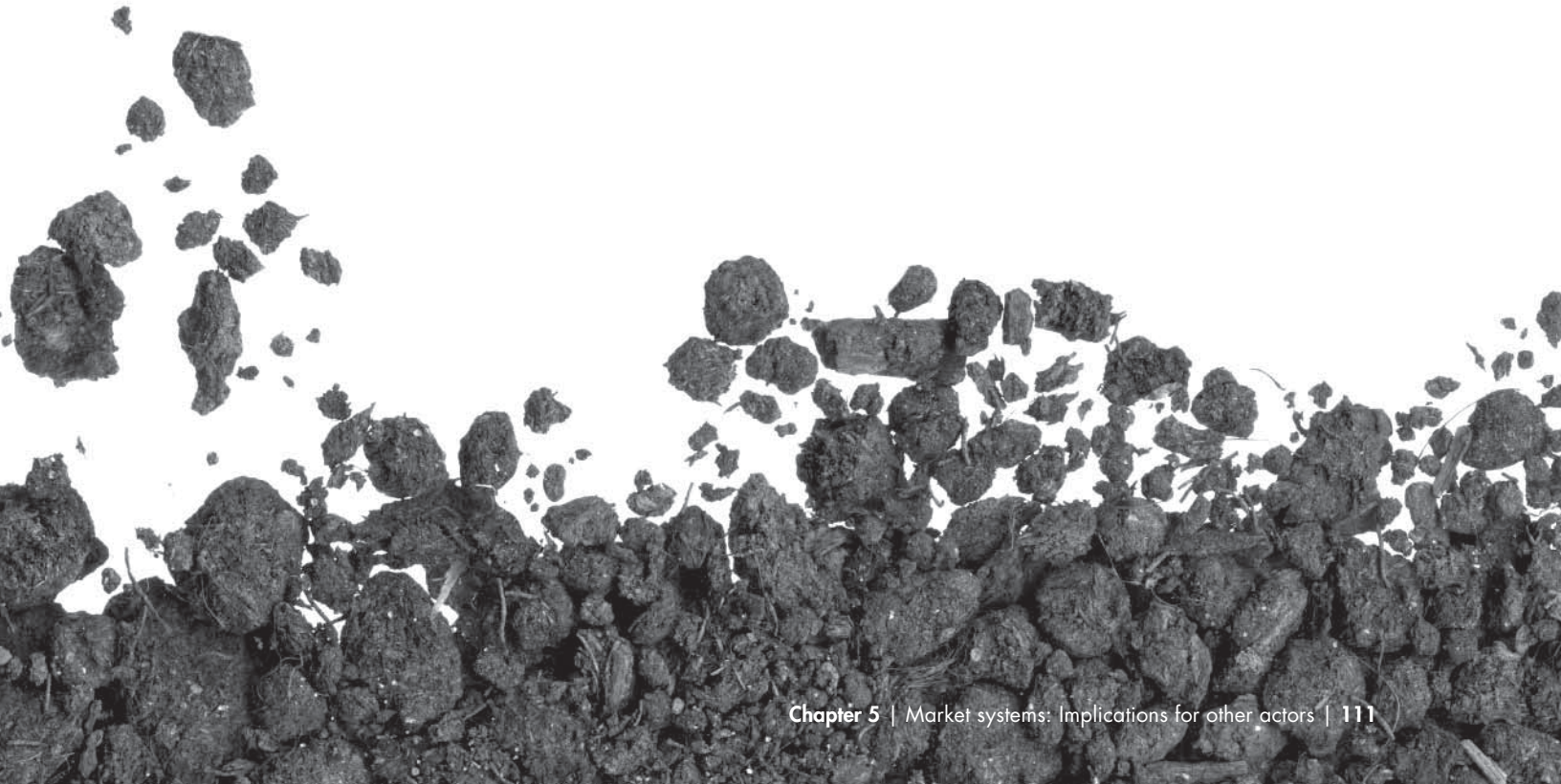
degree to which firms can address them—as well as the ease with which pioneer firms can build and adjust Repeatable Models to fit their market.

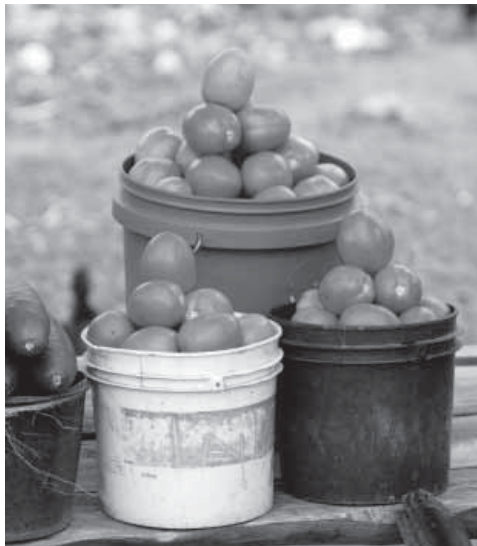
This is why it is so important to understand how the system affects the Four A's and the ability to create Repeatable Models. At a minimum, a strong system that supports the Four A's is one in which information flows freely to promote awareness, operates predictably and transparently to support advantage, facilitates widespread affordability by efficient and extensive access to credit, and is underpinned by physical infrastructure that allows for access. Some specific examples of the system elements that affect the Four A's are:

- **Awareness:** The existence of effective media and advertising infrastructure, like radio and written press, to provide customer education; the overall quality, transparency and reliability of information that travels through these media; the ways in which communities interact and the extent and types of interactions between one village and the next. More recently, mobile phones have played an increasing role in the rapid and efficient spread of information across communities.
- **Advantage:** Farmer access to complementary, high-quality and fairly priced inputs; regulatory frameworks and government policies that ensure quality standards and that can either promote or undermine the use of high-quality agricultural inputs; the existence and availability of reliable markets to which a farmer may sell his or her outputs; farmer bargaining power within that market to ensure a fair price for what he or she sells.
- **Affordability:** Farmer access to credit, remittances and informal borrowing; the system of taxes and subsidies, as well as other factors that affect the costs of inputs for the firm, which, in turn, affect pricing.
- **Access:** Physical infrastructure (roads, transportation, ports), marketplaces and trading centers; informal customs and norms that impact who can access a product or service (this may be especially relevant to the adoption of innovations by women).

The role of key actors in the system

Throughout our field work, we saw numerous examples of interactions among pioneer firms, other major actors and the system as a whole. Although we cannot hope to





explore all of the complexities of these interactions, in the interest of providing actionable advice to firms and other major actors, we will share our main observations on the roles we believe large corporations, foundations and development agencies, impact investors, NGOs and governments can play to help drive adoption of agricultural innovations through enhancing the conditions of the Four A's and enabling the creation of Repeatable Models.

Corporations

Corporations, especially multinationals, are important players in global agricultural supply chains and increasingly influence—directly or indirectly—the products and services that smallholder farmers use. As major buyers of agricultural outputs and suppliers of critical inputs, they can play an outsized role in creating realized advantage for smallholder farmers.

Corporations can provide smallholder farmers with a predictable place to sell their agricultural outputs, thereby giving these farmers more confidence that their investments in increased productivity will result in wealth increase, year after year. In fact, the demand from these multinational buyers can sometimes stimulate significant increases in economic activity in a region or country. This "market making" role of corporations is perhaps most pronounced in noncommodity cash crops like cocoa and coffee, where smallholder farmers constitute more than 80% of supply.[44]

However, as corporations face the reality of persistent low productivity in developing countries and the prospect of demand growth outstripping supply growth, they are realizing that securing a long-term supply of quality inputs, in the right quantity at the right price, will require a reconsideration of their procurement model. This means providing financing to smallholder farmers and greater investment in capacity-building and market services, often delivered in conjunction with local NGOs, pioneer firms or government partners, to encourage the adoption of new practices and technologies critical to increasing output productivity and quality.

An inclusive, high-engagement supply-chain model built by harnessing the Four A's of adoption provides an enhanced livelihood for smallholder farmers, while serving the business interests of the corporations themselves.

A good example of these inclusive, "high-engagement" supply-chain models can be seen in the activities of Olam International, one of the world's leading agribusinesses. Olam International is active across the value chain, from growing and sourcing to trading and processing in 65 countries. The company buys indirectly from an extended network of 3.5 million farmers worldwide, most of whom are smallholders with one- to three-hectare plots. In 2010, Olam International created the Olam Livelihood Charter for those farmers with whom the company works directly. The charter seeks to address a broad range of needs among smallholders and their communities, many of which tie directly to the Four A's: financing for the purchase of inputs, providing seeds and agrichemicals for improved yield, training on labor practices and providing market access that recognizes a premium for quality. To date, the 20 Olam Livelihood Charter initiatives have reached more than 300,000 farmers covering more than 500,000 hectares of land.[45]

Among consumer product companies, Unilever, which accounts for approximately 12% of the world's black tea purchases and 3% of palm oil purchases, has focused on building inclusive businesses and sustainable sourcing as part of its far-reaching Sustainable Living Plan.[46] This plan aims to have "a positive impact on the lives of 5.5 million people by improving the livelihoods of smallholder farmers, improving the incomes of small-scale retailers and increasing the participation of young entrepreneurs in our value chain."

As part of this goal, Unilever hopes to engage with at least 500,000 smallholder farmers, particularly those within their cocoa, tea and vanilla supply chains. Specifically, in partnership with the Rainforest Alliance, Unilever has trained more than one-half of the smallholder farmers in Kenya who grow tea, the country's largest export crop.[47] Unilever is also taking a multi-stakeholder approach to engaging smallholders. In February 2014, they signed a five-year public–private partnership agreement with the International Fund for Agricultural Development to work with smallholder farmers to improve food security; they have also entered into other agreements with supplier companies, associations, development agencies and foundations.[48]

The investment made by Mars Chocolate in "Cocoa Development Centers" (CDCs) provides another good example.[49] Through CDCs, Mars Chocolate seeks to increase the capacity of cocoa farmers and build their entrepreneurial skills by providing tools, training and techniques to cultivate high-quality crops. A CDC serves as the hub of research and best-practice demonstration

Investments can ensure a more sustainable source of input supply for corporations while improving smallholder livelihoods

for a village. Linked to the CDC are "Cocoa Village Centers"(CVCs) run by local entrepreneurs who serve as entrepreneurial role models, demonstrating best practices and selling essential agricultural goods and services to other farmers. The impact of the CDC–CVC model in Indonesia is impressive: In villages using the model, farmer yields have doubled or tripled. Based on its success in Indonesia, Mars transferred the CDC–CVC model to Côte d'Ivoire in 2010. The company has since established 16 CDCs in Côte d'Ivoire. Farmers' interest in participating in the program has exceeded capacity: In 2013, 500 farmers applied for 35 entrepreneur roles. Understanding the importance of collaborating within the ecosystem to expand the CDC–CVC system, the company has partnered with Côte d'Ivoire's government, leading certifiers and other supply-chain partners.

This kind of inclusive, high-engagement supply-chain model that is built harnessing the Four A's of adoption provides an enhanced livelihood for smallholder farmers in a sustainable way, while serving the business interests of the corporations themselves. The early successes of such investments by companies like Olam International, Unilever, Mars Chocolate and Nestlé[50] point to the opportunity for similar investments vis-à-vis other crop types as well. As natural resource constraints place increasing stress on global food supply, it behooves local and multinational primary agriculture buyers and producers of consumer products to systematically evaluate the opportunity to build more robust supply chains that include smallholder farmers. Ultimately, these investments will help ensure a more sustainable source of input supply for corporations while improving smallholder farmers' productivity and livelihoods.

Whereas corporations that focus on output purchasing have increasingly considered investments in smallholder farmers to the benefit of their business, large agricultural input companies (i.e., those selling seeds and agrichemicals) seem to have found reconciling the two more challenging. The market dynamics in sub-Saharan Africa and parts of South Asia—highly fragmented, geographically dispersed customers with limited individual purchasing power—mean that smallholder farmers have largely remained a segment that is structurally unprofitable for the large agri-input companies to serve.

However, some companies are forging creative partnerships where NGOs and pioneer firms have played a key intermediary role in aggregating demand, thereby positively altering the economics for the large corporation. For example, Keytrade, a $2 billion agrichemicals company, sells high-quality fertilizer at reduced cost to OAF for use on smallholder farms. Syngenta, one of the world's

largest agriculture companies, works with GADCO in Ghana to develop rice seeds that are specifically designed for the country's conditions and can help smallholder farmers increase their yields.

There is a great opportunity for large agriculture corporations to work more closely with pioneer firms to increase their ability to reach scale and, in turn, provide the corporations with a strong link to smallholder farmers. Corporations, by providing capital (in the form of grants or investments), expertise, networks and market access, can help pioneer firms build *and* scale their Repeatable Models, and, by extension, reach a large and growing base of smallholder farmer customers, more quickly and more effectively.

What we are clearly seeing is a more proactive stance on the part of major corporations to invest in smallholder farmers, either directly or through partner organizations. It reflects a growing orientation to define what is in the interest of the company in a way that considers both a longer time horizon and a broader set of stakeholders. Nevertheless, to date, the overall impact from such corporate investments remains less than what it could be for various reasons. One reason is that developing the necessary partnerships takes time, and it often requires new skills on the part of multinational corporations—skills that may not always be present in the core operating arms of these companies—as well as a well-entrenched mindset to see the shared value[51] that can be created in these sorts of multi-stakeholder endeavors. Often, the appetite for initiating these programs sits more squarely in the corporate social responsibility arm of corporations, and although that can be a good place to start, the risk that companies run is that the value of these programs never fully permeates the core business.

Corporations can tackle this challenge head-on by clearly articulating the overlap between corporate citizenship and strategic market development and by addressing internal barriers to launching *and* scaling programs that benefit smallholder farmers and pioneer firms. This can include putting in place the right organizational capabilities to cultivate, build and manage cross-sector partnerships, as well as the necessary management incentives and metrics to encourage and sustain efforts to sell to or source from smallholder farmers. Without undertaking this work, these programs, although laudable and progressive, will operate far below their full potential scale,[52] thereby compromising impact for corporations, their partners and the smallholder farmers with whom they work.

Foundations and development agencies

Foundations and development agencies are increasingly turning to the private sector to reduce poverty, seeing the potential of businesses to generate jobs and wealth,

A relentless pursuit of scale and impact by numbers without an understanding of what drives both can create inordinate pressure for premature expansion and inadvertently undermine the very organizations that grant makers are trying to support.

boost productivity and create market competition, while bringing innovative products and services to low-income communities. These agencies generally focus their efforts either on supporting firms directly, typically through a combination of grants or technical assistance, and perhaps increasingly channeling capital through third-party investors, or adopting systems-based approaches like Making Markets Work for the Poor (M4P)[53] or Participatory Market Systems.[54] In either case, interventions are most effective when they identify the system failure they seek to address and are careful that the interventions will result in a sustained solution.

Within a market, sometimes a discrete and direct intervention can fix a failing subsystem that is undermining one of the Four A's. For example, a specific, broad-based public education campaign funded by a foundation may help address awareness, as did the Gates Foundation's grant to IDEI that enabled it to invest in a wide range of market activation and customer education activities. This effort prepared the markets and systematically addressed a lack of awareness of microdrip irrigation products. On the back of this intervention, GEWP and other microdrip irrigation providers were able to generate sales and then sustain that awareness themselves.

However, as is the case with many interventions that are not structurally self-sustaining, once the direct intervention ceases, the program is in danger of losing momentum or, worse, reversing the good work done. In such cases, successful interventions may have to address the system's failure more indirectly or over a longer time horizon. For example, if ongoing awareness of a new product is a major problem, it may be more effective to support local media by demonstrating how reporting on interesting innovations helps drive higher circulation or listenership. Such an approach has been successfully implemented by the UK Department for International Development–funded Enhancing Nigerian Advocacy for a Better Business Environment (ENABLE)[55] program. Instead of intervening to advocate directly or fund advocacy conferences, it worked to build the respective capacity of existing business membership organizations, government, research organizations and the media to facilitate sustained public-private dialogue.

More generally, foundations and development agencies can help improve the business-enabling environment that supports the establishment of Repeatable Models. *From Blueprint to Scale: The Case for Philanthropy in Impact Investing* made the case that foundations and development agencies could play an important role in closing the early-stage pioneer gap by providing philanthropic capital that enables pioneer firms to test their innovations before they are able to attract other forms of capital, like impact funds. In doing so, foundations and development agencies are addressing the systems-based problem of access to capital.

What we are increasingly seeing is an ongoing role for targeted philanthropic capital, long after a company has passed through the early stages of its growth. As discussed in Chapter 4, building a Repeatable Model takes time and money. Pioneer firms need to invest ahead in people and systems and institutionalize an innovation capability to meet evolving customer needs and sustain market leadership. Grant capital is well suited to support

these types of investments, as in the example of Juhudi Kilimo, which uses grants from the Ford Foundation to fund new projects. The commonality across these grants is that they are used to build scalable platforms (people development, IT, R&D) that are critical to support future growth but that do not fundamentally subsidize the underlying unit economics for the pioneer firm.

In general, we believe the best way for development agencies and foundations to improve market systems is through a combination of demonstration (building a pilot to show what is possible), supporting firm-led innovation and helping to shape the broader system by working with and through existing market players to improve their capacity. Finding the right balance of these objectives, and avoiding unwanted distortions, is the art of good program design.

Specifically, the opportunity exists for foundations and development agencies to reconsider *how* they can optimize the impact of their funding through a fundamentally different approach to the grantee relationship. Understandably, there has been increasing pressure on grantees to demonstrate scale and impact. However, a relentless pursuit of scale and impact by numbers without a commensurate understanding of what drives both can create inordinate pressure for premature expansion and inadvertently undermine the very organizations that grant makers are trying to support.

The sort of shift we are describing requires foundations and development agencies to be more deeply engaged in and supportive of the need to address the strategic issues facing pioneer firms: defining their core market and distinctive capabilities, assessing the robustness of their Repeatable Model and determining when they are ready to expand to product and market adjacencies. Getting this right requires a more deliberate approach, one that better calibrates grant funding and that does not push management to make potentially bad decisions. It calls for a willingness to engage with the firm in discussions about what works and what doesn't and the openness to share lessons learned from successes *and* failures. It also calls for a greater understanding of the direct connection between customer advocacy, business performance and impact. Ultimately, it is through this reorientation that foundations and development agencies can best support pioneer firms to undertake the right actions in delivering on the Four A's and building truly scalable Repeatable Models—in effect, achieving good scale.

Impact investors

From Blueprint to Scale: The Case for Philanthropy in Impact Investing profiles the important role that impact investors play in helping pioneer firms grow: to be a source of "patient capital." Patient capital demands a return; a return indicates that a firm can grow sustainably in the long run, thereby creating value for customers as well as for investors. But it also has a high tolerance for risk, is flexible to meet the needs of entrepreneurs and accepts longer time horizons.

The importance of these long time horizons should be obvious from the analysis in this paper. Virtually all of the pioneer firms we studied either needed to engage in significant business model innovation or were functioning within broken or distorted systems that required nearly heroic efforts on the part of the firm to consistently deliver on the Four A's across tens of thousands, if not hundreds of thousands, of customers. Within this context, patience allows the firm the time to build its Repeatable Model within a particularly challenging operating environment and it helps the firm, to varying extents, begin to redefine and reshape the system.

Thus, the role of impact investors is to take the financial risk required to give a firm time to understand the Four A's and experiment with repeatable business models. Some impact investors are increasingly providing capital to pioneer firms, and although the goal of each individual investment must necessarily be to generate a positive return for investors, these investors must recognize that when they take risks on new, unproven business models, they are investing not only in the potential success of an individual firm but also in the potential growth of a new sector.

In addition, the daunting challenges that pioneer firms face in building Repeatable Models and adjusting them to fit the market has reinforced the need for impact investors to enhance their post-investment support, mainly by facilitating access to talent and expertise, ranging from senior personnel (e.g., board directors, mentors, senior management, subject matter experts) to more junior staff, including short-term hires. For example, Omidyar Network's HR department helps the organizations it supports find qualified staff at senior levels. It also offers insights and guidance regarding strategy, management, operations and legal matters and opens doors to a global network of contacts. By actively sharing best practices across its investment portfolio and the wider sector, Omidyar Network (and other impact investors) can quickly disseminate lessons about

How the pioneer firm affects the system

So far, we have highlighted how the market system can affect pioneer firms' success and/or failure to motivate adoption. But, because these firms are a key part of the system, this relationship goes both ways. Owing to their innovative and often first-moving nature, it is not uncommon for pioneer firms to disrupt a failing system and change it for the better.

When a pioneer firm disrupts a market, it is demonstrating that something different is possible. These firms not only offer new and better ways to serve the customer, but they do so within the context of a preexisting system. In the long run, these firms are pioneering improvements to the system for all who follow by offering customer education about products and services, new distribution channels and, potentially, dialogue with government agencies to improve the regulatory environment for everyone. In this way, pioneer firms lay the foundation for the market entry of all subsequent players.

Perhaps the most powerful potential impact of pioneer firms is their interaction with the market system. For example, in 2004 Acumen investee Ziqitza Healthcare Limited (ZHL), an emergency medical care start-up in Mumbai, India, decided to expand its fleet from 7 to 70 ambulances. The company offered an "access to all" model that allowed everyone in the city to dial the company's 1298 phone number and have an ambulance with life-saving equipment arrive within 15 minutes. ZHL not only succeeded in reaching its goal of expanding service throughout Mumbai, but also the firm's success caught the attention of state governments across India. When these governments opened tenders for emergency ambulance service, ZHL and a handful of newer start-ups won these tenders.

Today, ZHL's 800 ambulances serve nearly 2 million callers a year across 17 states. The company's growth has had a significant impact on the overall health system, on the healthcare infrastructure, on the operations of private and public hospitals, on the tender process, which has become more transparent, and on a shift in perception of millions of Indians who now have fast, reliable access to emergency care. It is this level of systemic change that the most successful pioneer firms can achieve if they manage to navigate the nuanced and complex set of interactions between their firm and other actors, both within and without/beyond the system as a whole.

The ultimate value of impact-oriented capital is in the influence created when a highly successful pioneer firm manages to disrupt and transform a broader market system.

NGOs can often be valuable partners for pioneer firms and even corporations by facilitating access to the challenging smallholder farmer customer segment.

what works and what does not. Last but not least, by bringing successful models to the attention of corporations, governments and the sector as a whole, they can encourage partnerships and acquisitions that will bring products and services to more customers.

The key balancing question for all impact investors is how hard to push for growth and profitability when investing in pioneer firms. More often than not, we have seen the push for scale come at the expense of companies getting their core right, and we have seen management teams and their boards of directors underestimate the complexities of expanding to new geographic areas or new product lines in agriculture. Impact investors needing to drive toward profitability and exit must balance the role they play with agricultural firms in particular, developing a solid understanding of what it takes to get the fundamentals right before a company grows.

Finally, as our paper has emphasized, agricultural pioneer firms must acquire extremely deep knowledge of their end customers. Similarly, impact investors that hope to succeed in supporting these firms must also be embedded, with strong local teams that possess the kind of knowledge that will help these pioneer firms succeed for the long run.

NGOs

NGOs frequently are already in farmers' communities and are therefore uniquely positioned to deeply understand farmers' needs, identify the barriers to adoption and test potential solutions to address them. As such, they can often be valuable partners for pioneer firms and even corporations by facilitating access to the challenging smallholder farmer customer segment.

NGOs can often identify and deliver the specific training required by local communities to realize the intended advantage from a new product or service. They can help build awareness by using their well-developed networks to identify likely early farmer adopters who can create the valuable demonstration effect. They can provide the information dissemination platforms to amplify subsequent word of mouth. For example, Digital Green uses videos in local languages to share information about new agricultural products, services and practices, including farmer success stories, across farmer communities. They play an even more important role in breaking through the prevailing social structures and ensuring that a product or service's benefits are known to more marginalized members of a community who may, due to their gender, caste or tribe, not be able to interact directly with other farmers in the community.

NGOs can help corporations conduct business with smallholder farmers by aggregating them into commercially viable "units," thereby facilitating farmer access to both inputs and markets. For example, Pradan, an India-based NGO, creates and fosters farmer cooperatives for poultry and silk production. For companies selling inputs or buying outputs, the cooperatives enable access that otherwise would be impossible if companies needed to reach smaller groups or individuals directly. The cooperatives also promote the conditions for adoption by providing training, facilitating financing and motivating the farmers to improve productivity.

Finally, a growing number of international NGOs, like TechnoServe, are providing advisory services and support to help pioneer firms develop and implement their Repeatable Model. NGOs can also use their access to smallholder farmer communities to conduct detailed customer-focused research and support the development of products and services designed specifically for farmers. Because pioneer firms often lack this access during the development stage or cannot afford the cost of research, NGOs can play an essential role by filling this void.

Indeed, several of our case-study firms were created by NGOs to fill a need identified through deep experience in farmer communities and with a recognition that market forces would provide a more scalable and sustainable solution to a pressing problem. This deep experience is the first step in building a Repeatable Model. BASIX Group's research identified the need for extension services as critical to improving farmers' livelihoods, which led to its creation of BASIX Krishi. IDEI created GEWP as a for-profit spin-off after its research on water scarcity in rural India identified microdrip irrigation as a viable solution. The K-Rep Development Agency, a Kenyan NGO, created Juhudi Kilimo to provide financing for income-generating assets after determining that farmers would use and benefit from this service. Sidai was founded by Farm Africa, a nonprofit working directly with smallholder farmers to share "techniques that boost harvests, reduce poverty, sustain natural resources and help end Africa's need for aid,"[56] to address the need for a better distribution and retail network for agriculture products.

The jury is still out on whether the NGO-to-firm route is the preferred method for creating agricultural pioneer firms. What we know is that it takes a long time, often years, to really understand customers and to earn their trust, something local NGOs are often well positioned to do. However, the transition from NGO to for-profit pioneer firm requires embracing a new set of constraints, a different operating model and, often, a new mentality altogether. The cultural overhang from a more traditional NGO mentality could be hard enough

to overcome that a better route might be to establish more pioneer firms from the outset.

Governments

Governments are often at the heart of all market systems. No single actor has so much influence on so many of the functions and rules that affect a market. For example, the government fundamentally controls the legal ownership of land, the most primary of agriculture inputs. Therefore, a full discussion of all the possible recommendations for governments is beyond the scope of this paper. Instead, what follows are recommendations based on the discussions we have had with the leadership teams at pioneer firms and our reflections on how governments have the opportunity to help spur adoption and support pioneer firms' success. These recommendations center on a range of key public goods critical to underpinning various elements of the Four A's.

To support advantage, governments should establish regulations for monitoring quality, such as creating norms for packaging and standards for testing products, thus giving farmers greater confidence to try new products and services. Given the prevalence of counterfeiting of agricultural products in Kenya (estimated at up to approximately 25% of pesticides in 2010),[57] both OAF and Sidai randomly test their products to ensure that what their suppliers are providing them is genuine and in the right proportions—particularly important for fertilizers and animal health products.

Similarly, the lack of quality standards and regulatory enforcement greatly hurt GEWP's business: Multiple unregulated, unregistered companies that do not pay taxes, entered the market offering low-quality products at even lower prices. Often, farmers who had trialed these lower-quality products encountered a number of problems, like blocked or burst pipes—experiences that reduced their confidence in drip irrigation as a whole.

Governments also have an important role to play in enhancing affordability by providing, or encouraging the provision of, credit to smallholder farmers and pioneer firms.

Increasingly, governments can step in as a core customer of pioneer firms themselves, allowing for the creation of large-scale robust firms, while recognizing that end users may not be in a position to pay the full cost of an innovative product or service.

Ready access to low-cost capital for farmers can allow them to purchase the required inputs. Many governments have realized the importance of finance in the agriculture sector and have provided incentives or mandates to banks.[58]

Public infrastructure investments, which help to improve farmers' access and awareness and generally support agriculture value chains, should be thought of as "table stakes." Farmers need roads and ports to gain access to markets for inputs and outputs, storage and cold chains to protect perishables and telecommunications and media access to broaden their awareness. Equally, government investment in research relating to agricultural technology can also enhance the conditions that promote adoption of innovations.

Governments should also carefully target investments in the form of public goods that directly benefit smallholder farmers. This includes providing extension services to farmers to help them develop knowledge required for making their farms commercially viable. Such programs should provide access to the latest technology and be available to all farmers, even those in remote locations. For example, the Kenyan government provides training and advisory services to crop and livestock farmers under its National Agriculture Extension Policy.

More generally, governments need to commit to promoting a business environment that encourages the establishment and success of pioneer firms. This means an efficient bureaucracy, predictable taxation and transparent regulation, to name just a few key conditions. Increasingly, it means government stepping in as a core customer of pioneer firms themselves, allowing for the creation of large-scale robust firms, while recognizing that end users—farmers or others—may not all be in a position to pay the full cost of an innovative product or service.[59] We should not be surprised that many pioneer firms, over time and at least partially, will transition from business-to-consumer models to business-to-business or even business-to-government ones (see the sidebar on page 120). This is a transition we see primarily outside of the agricultural sector, but we expect it will permeate more sectors over time. Doing

so frees up the government to play its role as a provider of public goods without having to step in to deliver on all parts of the agricultural value chain, a role that is often rife with inefficiency.

Again, these various suggestions only scratch the surface of the many ways in which governments can influence the systems that affect the Four A's and the ease with which a firm can successfully create a Repeatable Model. However, we hope it serves to demonstrate the importance of the wider system, including the effect that a multitude of actors external to the firm and farmers themselves can have on the adoption of agricultural innovation.

43 The analysis of market systems is well established, and our starting point is the work of the think tank and development consultancy, the Springfield Centre.

44 Based on estimates from the World Cocoa Foundation, the International Cocoa Association, the International Coffee Association, the Fairtrade Foundation and the FAO.

45 See Olam International's website, http://olamgroup.com/sustainability/olam-livelihood-charter/, for more details.

46 See "Sustainable Sourcing," Unilever's website, http://www.unilever.co.uk/sustainable-living-2014/sustainable-sourcing/, and "Inclusive Business," Unilever's website, http://www.unilever.co.uk/sustainable-living-2014/inclusive-business/, for more details.

47 "Unilever: In Search of the Good Business," *The Economist*, August 9, 2014.

48 "Livelihoods for Smallholder Farmers," Unilever's website, http://www.unilever.com/sustainable-living-2014/enhancing-livelihoods/inclusive-business/livelihoods-for-smallholder-farmers/index.aspx.

49 See "Securing Cocoa's Future: Technology Transfer," Mars's website, http://www.mars.com/global/brands/cocoa-sustainability/cocoa-sustainability-approach/technology.aspx, for more details.

50 Nestlé's Farmer Connect Program is creating "traceability up to farmers' level by buying either directly from farmers, cooperatives or selective traders, applying Nestlé's good agricultural standards, principles and practices with engagement in capacity building and training" (Hans Johr, "Creating Competitive Gaps in Upstream Supply Chains," Nestlé's website, http://www.nestle.com/asset-library/documents/library/presentations/investors_events/investor_seminar_2011/nis2011-02-supply-chain-competitive-gaps-hjoehr.pdf). The program aims to increase traceability and ensure quality, safety and volume growth of raw materials while mitigating price volatility and reducing transaction costs. See "Rural Development and Responsible Sourcing," Nestlé's website, www.nestle.com/csv/rural-development-responsible-sourcing for more information.

51 Shared value is defined as "policies and operating practices that enhance the competitiveness of a company while simultaneously advancing the economic and social conditions in the communities in which it operates. Shared value creation focuses on identifying and expanding the connections between societal and economic progress" (Michael Porter and Mark Kramer, "Creating Shared Value," *Harvard Business Review*, 2011).

52 Nestlé trained 300,000 farmers in 2013 through capacity-building programs, and Unilever has a goal to work with 500,000 smallholder farmers by 2020. On the agricultural inputs side, Syngenta is committed to reach 20 million smallholder farmers and enable them to increase productivity by 50%. See the following for more details: "Rural Development and Responsible Sourcing," Nestlé's website, http://www.nestle.com/csv/rural-development-responsible-sourcing; "Livelihoods for Smallholder Farmers," Unilever's website, http://www.unilever.com/sustainable-living-2014/enhancing-livelihoods/inclusive-business/livelihoods-for-smallholder-farmers/; and "Empower Smallholders," Syngenta's website, http://www.syngenta.com/global/corporate/en/goodgrowthplan/commitments/Pages/empower-smallholders.aspx.

53 The M4P Hub is a good source of information for such approaches. "Introduction," M4P Hub's website, http://www.m4phub.org/what-is-m4p/introduction.aspx.

54 Alison Griffith and Luis Ernesto Orsorio, "Participatory Market System Development: Best Practices in Implementation of Value Chain Development Programs," US Agency for International Development's website, http://pdf.usaid.gov/pdf_docs/PNADP050.pdf.

55 For details, see the Enhancing Nigerian Advocacy for a Better Business Environment's website, http://www.enable-nigeria.com/.

56 Farm Africa's website, https://www.farmafrica.org/us/about/about-us.

57 Agnes Karingu and Patrick Karanja Ngugi, "Determinants of the Infiltration of Counterfeit Agro-based products in Kenya: A Case of Suppliers in Nairobi," *International Journal of Social Sciences and Entrepreneurship* 1, no. 5 (2013): 28–36.

58 One example of this is priority sector lending in India. The Reserve Bank of India mandates that 40% of domestic banks (both public and private) and 32% of foreign banks' net bank credit should be directed to the priority sector, including agricultural activity. Although attractive from a policy perspective, the impact of this policy on farm credit in India has been mixed. This is not surprising, since the challenge of administering such loans has prevented many organizations from extending credit directly to farmers. For example, though microfinance can work for farmers engaged in raising livestock that produce a regular income (like milk from cows), the typical weekly repayment structure presents a challenge to those farmers reliant exclusively on a harvest of crops twice a year. Some microfinance companies, like Acumen investee NRSP Bank in Pakistan, have succeeded in creating products that are tailored to the needs of these types of smallholder farmers.

59 In many countries, like India, farmers fall under a regulatory framework (e.g., the Agriculture Produce Market Committee) that sets prices and purchases on behalf of the government. In this way, the government is often a major purchaser of farmer output.

6.

The long view: Why growing prosperity matters more than ever

In this final chapter, we address three interrelated issues when considering the long-term investments in smallholder agriculture: urbanization, demographic change and farm size and climate change.

"Changes are products of intensive efforts."

—Muhammad Yunus

The long view: Why growing prosperity matters more than ever

As we noted in the introduction to this study, agriculture is the main livelihood for the rural poor across the world. This report has focused on how pioneer firms can help smallholder farmers adopt innovations that increase productivity and incomes. However, there are many interrelated topics that we have not been able to address or have only been able to cover in passing.

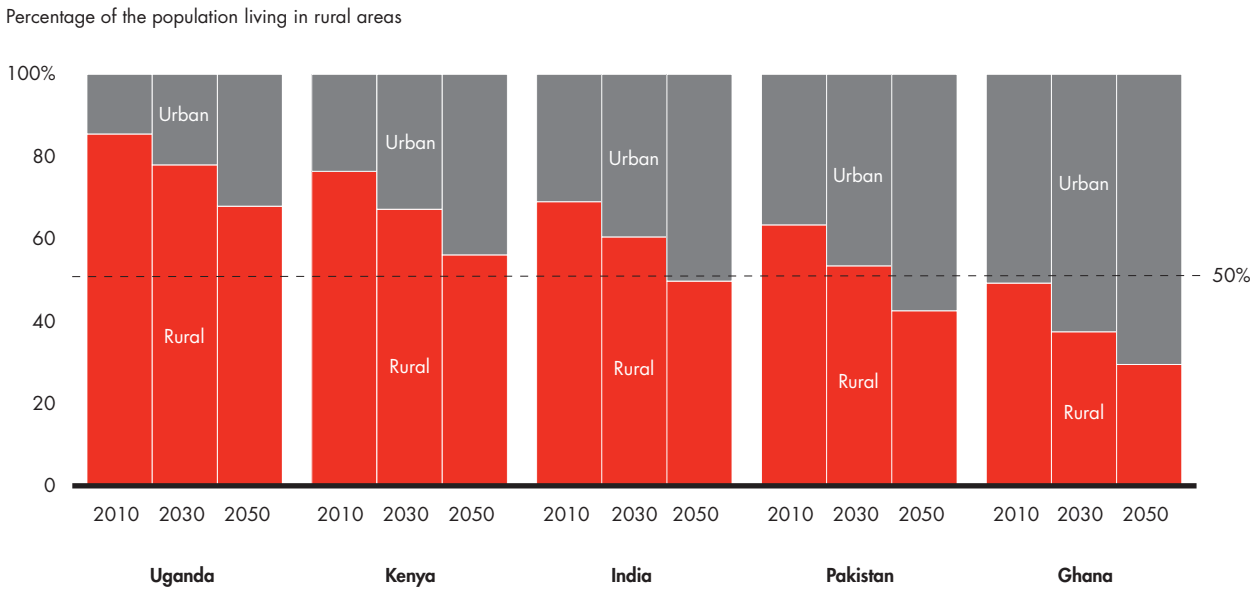
In the long run, is more productively farming on small plots of land the best way to address poverty? There is no simple consensus to such a broad question, but three interrelated issues at play should inform long-term investments in smallholder agriculture.

Urbanization

In the course of our research for this paper, we encountered a number of development professionals who raised concerns about our focus on smallholder farming. They emphasized the importance of helping subsistence farmers find alternative livelihoods, because many are structurally unable to meaningfully increase their family's income through their labor on such a small amount of land. The most frequently cited trend was urbanization and the benefits experienced by smallholder farmers who could more productively use their unskilled labor in a restaurant or hotel or as a taxi driver. Undoubtedly, urbanization is a trend that will continue and, for some, will increase their incomes more effectively than increasing the productivity of their very small farm.

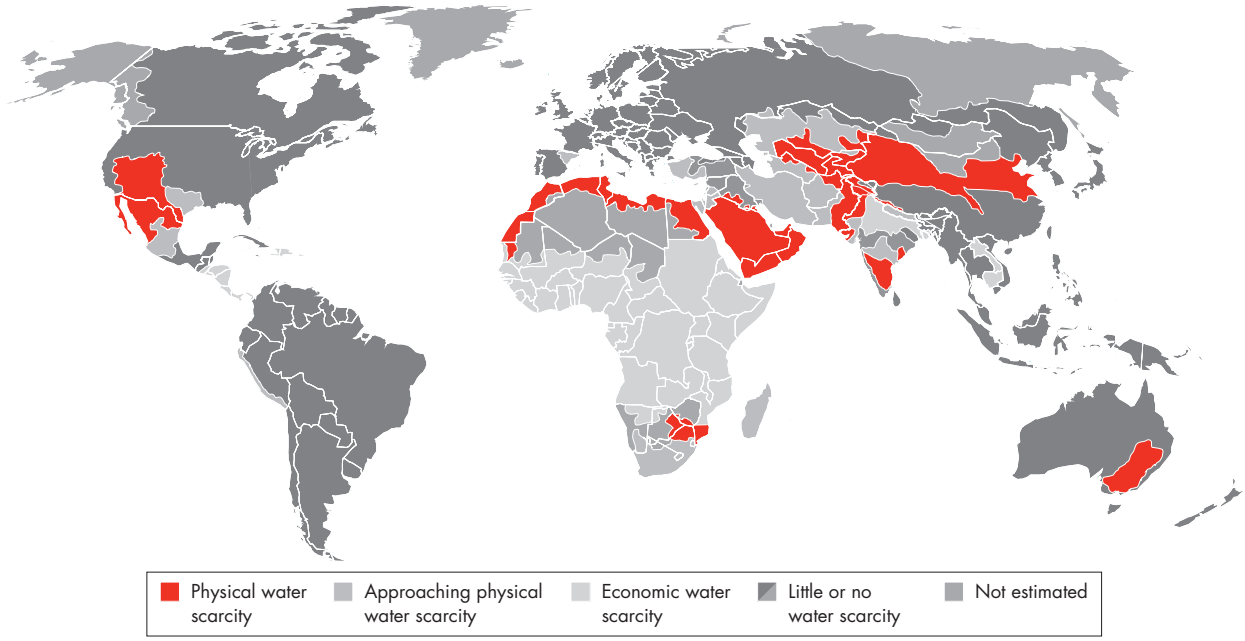
However, in most of the countries we focused on for this study, even by 2050, the majority of the populations will still be in rural areas and many people will likely be focused on agriculture as a livelihood (*see Figure 28*). As a result, the need to enhance productivity and generate a greater return on land and labor through adoption of new technologies will be critical over the next 30

Figure 28: Urbanization will increase over the next 35 years, but many will still live in rural areas through 2050



Source: United Nations Department of Economic and Social Affairs, Population Division, 2014 Revision of the World Urbanization Prospects

Figure 29: Already, much of the world suffers from the lack of economic water reserves



Source: International Water Management Institute

years or more for the more than 1 billion people in these countries reliant on agriculture for their livelihood.[60]

Demographic change and farm size

Related to the point about urbanization was a common refrain that smallholder farming is simply not a long-term economically viable path out of poverty. Small farm sizes generate insufficient income to justify the capital investment in technologies, like tractors, that would help significantly increase productivity. Unfortunately, this trend may be worsening as population growth leads to familial land being apportioned to new generations in increasingly diminished shares.

Climate change

In our conversations with pioneer firms and smallholder farmers, many mentioned that once-regular rains and predictable growing seasons were now irregular and undependable. As a result, freshwater withdrawals from water systems (aquifers, rivers and lakes) are depleting access to agricultural water (*see Figure 29*). Environmental changes pose challenges for farmers around the world but disproportionately affect those without the means to quickly adapt. The issue of sufficient water for crops was pervasive across the countries we focused on: India, Pakistan, Kenya, Uganda and Ghana.

These significant trends are shaping the future of smallholder farming. To secure food supply, particularly for smallholders who rely on their production for a significant portion of their calories, the adoption of agricultural innovations is a political, economic and social imperative. Collectively, they point to the need to intensify agricultural productivity in an environment of increasingly diminished natural resources. As a result, the role of the pioneer firm in driving the adoption of agricultural innovations and growing prosperity is all the more important, now and into the future.

60 United Nations, Department of Economic and Social Affairs, Population Division, World Urbanization Prospects: The 2011 Revision, New York: United Nations, 2012.

Pioneer firm management interviews

BASIX Krishi

- Vijay Mahajan
- Arijit Dutta
- Abanikanta Bhuyan
- Bhaskar Muthyala
- Venkatanarayana D.

GADC

- Bruce Robertson
- Justus Kilian

GADCO

- Karan Chopra
- Iggy Bassi
- Kathleen Berroth

GEWP

- Amitabha Sadangi
- Vikas Saini
- Priyaranjan Behera

Juhudi Kilimo

- Nat Robinson
- Benjamin Kimosop
- Caroline Chelimo Cheboi
- Job Kirui Langa't
- Nancy Butama
- Mujeni Aseli
- Shadrack Mutungo

KK Foods

- James Kanyije

NRSP Bank

- Zahoor Hussain Khan
- Asim Juneja

OAF

- Andrew Youn
- Stephanie Hanson
- Kiette Tucker
- Eric Solomonson

Sidai

- Christie Peacock
- Anthony Wainaina

SV Agri

- Hemant Gaur
- Anil Godara

Western Seeds

- Saleem Esmail
- Karsten Wichmann
- Syed Osman Bokhari

Individuals and organizations interviewed

Abdul Samad Khan, Eng
Abhinav Shah, Raya Dairy
Aleem Ahmed, Love Grain, previously Ethiopian Agricultural Transformation Agency
Anish Kumar, PRADAN
Anurag Agrawal, Intellecap
Ashish Karamchandani, Monitor Deloitte Inclusive Markets
Atreya Rayaprolu, Intellecap
Avinash Krishnamurthy, S3IDF
Bill Grant, DAI
Bryan Lee, Krishi Star
Damian Miller, Orb Energy
Dana Boggess, Bill & Melinda Gates Foundation
David Bell, Harvard Business School
David Elliot, Springfield Centre
David Small, d.light
Deodatt Singh, Sunhara India
Don Seville, Sustainable Food Lab
Elicia Carmichael, Root Capital
Gupta Banjara, Katalyst
Habtemariam Abate, Ethiopian Agricultural Transformation Agency
Harold Mate, Farm Concern International
Harun Baiya, SITE
Jinesh Shah, Omnivore Partners
Joost Bonsen, MIT Media Lab
Julian Peach, Independent development consultant
Juliet Omanya, Farm Concern International
Kartik Srivatsa, Aspada
Krisila Benson, Technoserve
Kushal Agrawal, Aspada
Manish Shankar, Intellecap
Mark Carrato, USAID
Matthew Rees, USAID
Michael Carter, UC Davis
Mike Kinuthia, Pearl Capital
Mike McCreless, Root Capital
Mumbi Kimathi, Farm Concern International
Nate Gonzalez, Accion Venture Lab
Nilotpal Pathak, Intellecap
Paul Breloff, Accion Venture Lab
Paul Stewart, Technoserve
Rahul Kulkarni, USAID
Ramakrishnan Hariharan, Syngenta Foundation
Raman Singh Saluja, Gramco
Richard Caldwell, Bill & Melinda Gates Foundation
Rikin Gandhi, Digital Green
Rob Hitchens, Springfield Centre
Rose Goslinga, Syngenta Foundation
Shayna Harris, Mars Global Chocolate
Sikandar Mustafa Khan, Millat Group
Simon Desjardins, Shell Foundation
Simon Winter, Technoserve
Sitanshu Sheth, Agrostar
Stanley Mwangi, Farm Concern International
Stanley Wood, Bill & Melinda Gates Foundation
Stephen Gudz, USAID
Susan Bornstein, Technoserve
Sweta Mangal, Ziqitza Healthcare Limited
Tavneet Suri, MIT Sloan School of Management
Tom Adlam, Pearl Capital
Vijaya Pastala, Under the Mango Tree
Vikas Raj, Accion Venture Lab
Vineet Rai, Aavishkaar
Windy Wilkins, Bill & Melinda Gates Foundation

Acknowledgments

The authors would like to thank a number of organizations and people who made this paper possible.

The Bill & Melinda Gates Foundation for their generous support and, in particular, Dana Boggess, for her input and guidance throughout the research and writing process.

The pioneer firms we profiled throughout the paper, who facilitated our field research and who are leading the way to help grow prosperity for farmers across sub-Saharan Africa and South Asia, for generously sharing their insights, struggles and best practices.

The Acumen team across Ghana, East Africa, India and Pakistan for their support of the field research and for sharing their perspectives on how to spur adoption and scale a pioneer firm. In particular, we want to thank Sachin Rudra and Shuaib Siddiqui.

The Bain & Company project team for their incredible commitment, diligence and curiosity: Jordan Domash, Aniruddh Mukhopadhaya, Urmil Shah and Balaji Venkataraman.

Bain & Company advisers in the Agriculture, Consumer Products and Strategy practices for their counsel and thought partnership: Jimmy Allen, James Hadley, Dalton Maine, Nikhil Ojha, Dunigan O'Keeffe, Sri Rajan, Satish Shankar, Karan Singh, Richard Webster and Chris Zook.

A diverse and generous group of external experts for their thoughtful input; in particular, Paul Breloff, Anne Marie Burgoyne, Mark Carrato, David Elliot, Nilotpal Pathak, Julian Peach and Simon Winter for reviewing our drafts and helping us fine-tune the report and its recommendations.

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Bain is committed to supporting high-impact organizations who tackle global poverty through entrepreneurial models or by catalyzing entrepreneurship. Bain partners with these organizations to develop and implement strategies, strengthen capabilities and shape sector thinking. We work alongside our clients toward the shared goal of accelerating global economic development.

About Acumen

Acumen is working to change the way the world tackles poverty by investing in companies, leaders and ideas. Acumen invests patient capital in business models that deliver critical goods and services to the world's poor, improving the lives of millions. Since 2001, Acumen has invested more than $89 million in 86 companies that provide access to agricultural services, water, health, housing and education to low-income customers in South Asia, East Africa and West Africa. Acumen is also working to build a global community of emerging leaders who are equipped to create a more inclusive world through the tools of both business and philanthropy.

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