## CONTENTS

**Foreword** 1  

**Introduction** 5  
Key Messages 5  
Objectives of the Handbook 6  
The Changing Market Landscape 6  
Understanding Smallholder Farmers 7  
IFC Expertise in Agribusiness and Smallholder Supply Chain Support 9  

**The Business Case for Working More Closely with Smallholders** 11  
Key Messages 11  
Drivers for Working Directly with Smallholder Farmers 12  
Investment Climate and Risk in Working with Smallholders 13  
The Business Case, from Smallholders’ Perspective 14  
Moving Forward: Initial Steps 15  

**Agricultural Finance and Agribusinesses** 17  
Key Messages 17  
Access to Finance for Smallholders: The Business Case 18  
Value Chains in Contract Farming: An Overview 18  
Direct Lending to Farmers by Agribusiness Firms 19  
Financial Institution Lending for Smallholders 20  
Other Financial Products and Services for Smallholders 21
<table>
<thead>
<tr>
<th>Section Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Aggregation and Working Cost-Effectively at Scale</td>
<td>23</td>
</tr>
<tr>
<td>Key Messages</td>
<td>23</td>
</tr>
<tr>
<td>Aggregation Options for Reaching and Integrating Smallholders</td>
<td>24</td>
</tr>
<tr>
<td>Food Crops for Domestic Markets: Implications for Aggregation</td>
<td>25</td>
</tr>
<tr>
<td>The Business Case for Working with POs</td>
<td>26</td>
</tr>
<tr>
<td>Best Practices for Aggregation</td>
<td>26</td>
</tr>
<tr>
<td>Standards for Sustainability and Quality</td>
<td>31</td>
</tr>
<tr>
<td>Key Messages</td>
<td>31</td>
</tr>
<tr>
<td>The Business Case for Standards in Smallholder Supply Chains</td>
<td>32</td>
</tr>
<tr>
<td>Expansion of Market Access</td>
<td>32</td>
</tr>
<tr>
<td>Costs of Implementing Standards</td>
<td>33</td>
</tr>
<tr>
<td>Best Practices for Implementing Standards</td>
<td>33</td>
</tr>
<tr>
<td>Training and Communication</td>
<td>37</td>
</tr>
<tr>
<td>Key Messages</td>
<td>37</td>
</tr>
<tr>
<td>Farmer Training: Strategies and Best Practices</td>
<td>38</td>
</tr>
<tr>
<td>Communication to Expand Reach</td>
<td>40</td>
</tr>
<tr>
<td>Yield Gaps</td>
<td>45</td>
</tr>
<tr>
<td>Key Messages</td>
<td>45</td>
</tr>
<tr>
<td>The Business Case for Improving Farm Management and Input Use</td>
<td>46</td>
</tr>
<tr>
<td>Strategies and Best Practices for Improved Farm Management</td>
<td>47</td>
</tr>
<tr>
<td>Women's Participation</td>
<td>51</td>
</tr>
<tr>
<td>Key Messages</td>
<td>51</td>
</tr>
<tr>
<td>The Business Case for Women's Participation in Smallholder Supply Chains</td>
<td>52</td>
</tr>
<tr>
<td>Increasing Women's Participation</td>
<td>55</td>
</tr>
<tr>
<td>Partnerships for Sustainable Value Chains</td>
<td>59</td>
</tr>
<tr>
<td>Key Messages</td>
<td>59</td>
</tr>
<tr>
<td>Types of Agribusiness Partnerships</td>
<td>60</td>
</tr>
<tr>
<td>Multistakeholder Partnerships in Smallholder-Based Value Chains</td>
<td>60</td>
</tr>
<tr>
<td>Public-Private Partnerships for Development</td>
<td>61</td>
</tr>
<tr>
<td>Value Chain or Sector Coordination Partnerships</td>
<td>62</td>
</tr>
<tr>
<td>PPPs to Promote Transformative Change at Scale</td>
<td>63</td>
</tr>
<tr>
<td>Best Practices for Building Strong Partnerships</td>
<td>64</td>
</tr>
<tr>
<td>Measuring Results</td>
<td>67</td>
</tr>
<tr>
<td>Key Messages</td>
<td>67</td>
</tr>
<tr>
<td>The Business Case for Measuring Results</td>
<td>68</td>
</tr>
</tbody>
</table>
One of our greatest challenges is meeting society’s growing food needs while simultaneously reducing agriculture’s environmental footprint. This will require the “sustainable intensification” of agriculture: producing more food on less land, with less water, and in a more sustainable way. This challenge is exacerbated in low- and lower-middle-income countries, where 95 percent of all farms are smaller than five hectares. There are about 450 million smallholder farmers, predominantly in Asia and Africa. The overwhelming majority of them have low productivity and face constraints in accessing inputs, finance, knowledge, technology, labor, and markets.

Growth in emerging markets and rising demand for higher quality food products create new opportunities for private firms along the entire agricultural value chains. In parallel, emerging technologies are making it possible to lower costs and dramatically re-shape these value chains. However, technologies are also introducing new risks of disruption and redundancy. To counter these forces, ingenuity, innovation, and considerable investments will be needed for decades to come.

The future of agriculture requires new and pioneering partnerships between different stakeholders in the food system. Achieving the Sustainable Development Goals to end extreme poverty by 2030 will require an estimated $4.5 trillion annually—far more resources than multilateral development banks or donors can provide by themselves. To meet this challenge, the International Finance Corporation (IFC) is actively participating in designing the new “Maximizing Finance for
Development” (MFD) and “Cascade” approach; this approach entails working with governments to crowd in the private sector while optimizing the use of scarce public resources, including those in the agribusiness sector.

Since the first edition of this handbook was published in 2014, the IFC has doubled its agribusiness investment program from around $2 billion to $4 billion annually. Together with our development partners and private sector clients, we are also scaling up advisory programs that improve the livelihoods of smallholder farmers by linking them to modern supply chains, and we are creating opportunities to increase their productivity and improve their farming practices through greater access to financing, technology and high-quality inputs. The IFC supports innovative partnerships among agribusiness, financial institutions, technical assistance providers, governments, donors, and other stakeholders in building new systems of sustainable food production.

Firms increasingly need to establish and expand ways of working with consumer groups, governments, research institutes, civil society organizations, and the millions of smallholder farmers—especially in emerging markets—that are critical to the future supply of many agricultural products, including livestock, coffee, cocoa, vegetables, dairy and oil palm. Based on our experience, we believe firms can accomplish this while significantly contributing to better economic outcomes for all.

This handbook is a practical guide for firms who wish to expand their supply chains by working with smallholder farmers. The purpose is to enable more productive interactions between private firms and smallholders, creating value in all parts of the chain. This handbook is also a part of the IFC’s larger contribution to the development of the agribusiness sector, with the aim of shifting our global food system to one in which sustainable production is the norm and food and nutritional security is secured for future generations.

Tomasz Telma
Director and Global Head
Manufacturing, Agribusiness, & Services
International Finance Corporation
KEY MESSAGES

Meeting the food needs of the world’s 9.8 billion people in 2050 and reducing the numbers of malnourished will require an estimated increase of almost 50 percent in agricultural production.

This objective will be all the more challenging given the limited scope for expansion of cultivated area, the effects of climate change on agricultural production, and competing pressures on natural resources, including water.

An estimated 480 million smallholder farmers worldwide can help meet this target through stronger market links and productivity improvements.

More-vibrant smallholder agriculture, with enhanced participation of women and youth, holds the key to reduced poverty and hunger.

The International Finance Corporation (IFC) of the World Bank Group is working with global agribusiness firms to develop new and efficient ways of working with smallholder farmers.

Intended to support the sustainability and sourcing managers of global brands, including off-takers, input companies, service providers, and banks, this Working with Smallholders handbook explores new developments and best practices in working with smallholders.
Objectives of the Handbook

As agribusiness companies seek to secure future food supplies for the world’s growing population, smallholder farmers are becoming more important players in global food chains. Their role is expanding as land constraints limit the potential for growth in plantation agriculture and as the locus of future food market growth shifts to the Global South. Those markets face increasing demand for affordable, nutritious foods for low-income urban populations.

The changing market landscape offers opportunities—particularly for economic growth and rural poverty alleviation—but also poses challenges to upgrading and integrating smallholder agriculture against a backdrop of climate change and increasing water scarcity. Moreover, agribusiness companies are under increasing pressure from consumers, shareholders, governments, and other stakeholders to make public commitments on sustainability, including adoption of environmental and labor standards. Meeting these competing demands will require new ways of working and new partnerships to deliver change.

As a primer on key elements of a smallholder intervention strategy, this handbook is written for agribusiness operational managers who are responsible for integrating smallholder farmers into value chains as suppliers, clients, or customers. This handbook builds on the rapidly growing experience of working with smallholders, expanding the scope of the case studies.

The handbook’s main goal is to demonstrate the potential of working more productively—and profitably—with shareholder farmers while exploring key practical considerations, ultimately helping to multiply those opportunities where both farmers and firms can benefit from greater engagement.

The Changing Market Landscape

Agricultural production more than tripled between 1960 and 2015 (FAO 2017b). Even so, meeting the demand for food, feed, and biofuel in 2050—when the world’s population is expected to reach 9.8 billion (UN DESA 2017)—will require an almost 50 percent increase in production relative to 2012. And in Sub-Saharan Africa and South Asia, production must more than double (FAO 2017b).
Meeting the world’s food needs will not be easy. The remaining unused arable land is concentrated in a few countries and difficult to access. Average yields for staple crops such as rice, maize, wheat, and soybeans have increased only modestly, by 1 percent or less per year since the 1990s (FAO 2017b). Climate change, water scarcity, and an aging rural population all contribute further to the challenging context for agribusinesses seeking solutions to raw material sourcing.

This challenging context also presents opportunities. Agribusinesses are increasingly working directly with smallholder farmers in emerging markets in win-win arrangements that can help secure a sustainable supply of key agricultural commodities while boosting rural incomes and economic growth.

On the demand side, not only is the world population growing, but the locus and nature of market growth is also shifting. Although annual global population growth rates have declined for almost 50 years, the combined population of Africa and Asia is expected to increase by roughly 2 billion by 2050 (UN DESA 2017). That growth will drive large and expanding markets for affordable, nutritious food for low-income populations in those regions.

Moreover, the current 54 percent share of world population that is now urban is expected to grow to around two-thirds by 2050, including large urban populations in low- and middle-income countries (UNCTAD 2017). Urbanization affects food consumption patterns in several ways: increasing demand for processed foods, store- or vendor-bought convenience foods, animal-source foods, fruits, and vegetables, which in turn increases demand for animal feed while shifting labor demand away from agriculture and toward the transport, wholesaling, retailing, food processing, and vending sectors.

**Understanding Smallholder Farmers**

Of an estimated 570 million farms worldwide, almost 480 million are smallholder farms in low- and middle-income countries, representing 84 percent of all farms and operating about 12 percent of all farmland (FAO 2017b). Over the past 50 years, the broad trend in high-income countries has been toward increased consolidation in farm holdings, while low- and middle-income countries have generally shown a trend toward smaller average farm size.
Smallholders are a fragmented and diverse group—factors that contribute to the challenges in working with them. Nonetheless, they share some common characteristics:

- Most smallholders work and live within traditional support and power structures.
- Smallholders generally sell their crops through local supply chains, which typically begin with village collectors or producer organizations (POs) and continue through a series of traders, who aggregate volumes as the crops pass along the supply chain.
- Village collectors (and sometimes POs or cooperatives) may extend credit and loan agricultural inputs such as fertilizer, with the repayment expected at harvest time.

Overall, these farmers face a variety of challenges, ranging from limitations in agricultural practices, market access, and other capacities to legal, financial, and various other resource constraints. As a result, quality and productivity vary widely among smallholder farmers depending on their ability to invest. Despite these challenges, a wealth of evidence now indicates that smallholders respond positively to opportunities that enable them to join global supply chains and contribute to food security, poverty reduction, and economic growth (figure 1).

**FIGURE 1 Step-by-Step Approach to Developing Effective Smallholder Engagement Programs**

*Gender is a consideration in each phase of a supply chain intervention*
IFC Expertise in Agribusiness and Smallholder Supply Chain Support

The International Finance Corporation (IFC) of the World Bank Group has made agribusiness a priority because of its potential for broad development impact and its especially strong role in reaching rural areas—where about 70 percent of the world’s poor live. Through investments and advisory services, the IFC helps the private sector address higher global demand for food, fuel, and fiber in an environmentally sustainable and socially inclusive way.

Since 2014, the IFC has scaled up its agribusiness investment program from around $2 billion per year to around $4 billion per year. These investments include direct investments in agricultural production and processing, fertilizers and other agricultural inputs, forestry and wood products, food retail, and agrifinancing projects via financial institutions, equity funds, and financial mobilization. The IFC delivers advisory services with development partners.

The IFC also supports global initiatives for sustainable production of agricultural commodities. It works with the multilateral Global Agriculture & Food Security Program (GAFSP), where it manages the “Private Sector Window” identifying private funding and financing aimed at increasing the commercial potential of small and medium-size agribusinesses and farmers by connecting them with local, national, and global value chains.

Working particularly in low-income countries, the IFC seeks to improve smallholders’ access to markets, financing, technical assistance, and inputs such as fertilizer and seeds. These initiatives include efforts to strengthen firms’ supply chains by helping smallholder farmers increase productivity and apply appropriate environmental, social, and quality standards.
THE BUSINESS CASE FOR WORKING MORE CLOSELY WITH SMALLHOLDERS

KEY MESSAGES

➤ Firms are engaging more directly with smallholder farmers, principally to secure supply.

➤ Other drivers for working more closely with smallholders include expansion into new food markets in low- and middle-income countries, consumer demands for sustainable sourcing, and food safety.

➤ For input companies and service providers, smallholders offer potential for significant market expansion.

➤ Smallholders are already key players in some supply chains, providing 70–90 percent of volumes in beverage crops and cotton.

➤ Yet working with smallholders is often considered risky, particularly because of multiple constraints on smallholder productivity and the potential for side-selling.

➤ Nonetheless, there is mounting evidence that carefully designed programs can deliver enhanced quantity and quality of supply, at lower procurement cost.

➤ The public sector is promoting private sector engagement, support, and collaboration with smallholders through funding for public-private partnerships.
Drivers for Working Directly with Smallholder Farmers

Firms can source from or sell to small farms by working through traders or other intermediaries, but a decision to engage more closely with small farms is driven by several types of incentives:

- *The need to secure sourcing for agricultural value chains*, with smallholders representing the only significant means for increased sourcing. World demand for staple crops is projected to grow by 60 percent by 2050 (compared with 2010), while crop area is likely to grow by only 10 percent (Fischer, Byerlee, and Edmeades 2014). However, there is considerable scope to increase yields in smallholder agriculture, which will hence become more important in global supply chains.

- *Smallholder dominance or advantage in the production of certain crops.* In some sectors, such as coffee and cocoa, smallholder farmers dominate production (supplying 70–90 percent), so firms must work with these smallholders. In other sectors, such as cut flowers, tree fruits, and other labor-intensive crops, smallholders may be more efficient than large farms.

- *The business opportunity offered by new markets for inputs, services, and output.* For global firms seeking to tap into the food or feed sales potential of emerging markets, local sourcing may be their most competitive option. Input companies registered increases in sales volumes and grew their client base threefold to fivefold in a study of companies extending their reach to cover smallholders (Hystra 2015).

- *Consumer demand for increased sustainability, responsible sourcing, or food of known origins.* Growing consumer demand for sustainably sourced food drives the expansion of the market for certified products from both specialty and high-volume retailers. By working more closely with smallholder farmers, firms increase their ability to identify potential risks in the supply chain, allowing them to proactively respond to issues before they become liabilities or crises.

- *Food safety concerns.* Specifically, the safety issues include the need to prevent and manage contamination and foodborne illness. Firms that engage with smallholders to develop traceable supply chains can better monitor all the steps involved in production, harvest, and processing. When problems are detected, such firms will already have systems in place to address the issue rapidly and effectively.
Table 1 describes short-, medium-, and long-term benefits of working with smallholder farmers.

**Investment Climate and Risk in Working with Smallholders**

Although global agribusiness now has considerable experience engaging with smallholder farmers, some companies still hold back. That reticence is often linked to risk and the expectation that such engagement would be costly.

**Investment Climate**

If frontier and emerging markets, and their smallholder farmers, are to play a greater role in global supply chains, there must be a favorable investment climate—that is, a set of policy, regulatory, and institutional factors sufficiently robust to encourage private sector investment. In recognition that the development of smallholder agriculture is important for global food supplies and the reduction of poverty and malnutrition, a growing number of public finance mechanisms have been developed to promote agribusiness engagement by sharing the risks and funding aspects of sector development.

<table>
<thead>
<tr>
<th><strong>Input manufacturers and suppliers</strong></th>
<th>Increased sales</th>
<th>More efficient distribution through groups</th>
<th>Markets for new products designed for smallholders</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Financial institutions</strong></td>
<td>Large numbers of potential customers</td>
<td>Development of outgrower arrangements to facilitate repayment</td>
<td>• Market for new financial products • Loyalty among emerging medium-scale farmers</td>
</tr>
<tr>
<td><strong>Agricultural information and training providers</strong></td>
<td>Large numbers of potential customers, who can be reached via ICTs at low cost</td>
<td>Partnerships with off-takers or input suppliers who may pay for services</td>
<td>Information needed to develop new products and services</td>
</tr>
<tr>
<td><strong>Off-takers and processors</strong></td>
<td>• Greater production from the same area • Better quality • More efficient logistics</td>
<td>• Traceability • Certification • Reduced environmental and social risk</td>
<td>• Stability of supply • Increased supplier loyalty</td>
</tr>
</tbody>
</table>

*Note: ICTs = information and communication technologies.*
Risk Management

Smallholders do not fit a single risk profile. They vary significantly in capability and capacity. Segmenting smallholders into different categories to evaluate risk and design engagement strategies is important. Through careful program design, firms can reduce some of the common risks of working with smallholders:

- **Side-selling.** Off-takers risk failing to recoup their investment because farmers divert part or most of their increased production to other buyers—a practice known as side-selling. By adopting strategies to tighten the supply chain, reduce side-selling, and promote supplier loyalty—such as by helping smallholders with immediate financial needs—agribusinesses can minimize this risk.

- **Low adoption of new practices.** Another risk is that farmers don’t adopt improved agricultural practices despite investments by off-takers or input suppliers aimed at helping them do so. Experience suggests farmers are more likely to adopt new practices that are reversible—that is, where it is not difficult (or expensive) to return to the status quo.

- **Unsustainability of improved practices.** After initial enthusiasm, smallholder farmers may decide that agricultural practices aimed at increasing productivity are not cost-effective options for their businesses. This handbook proposes ways for agribusinesses to work with smallholders to reduce the difficulty or expense of adopting improved practices.

The Business Case, from Smallholders’ Perspective

What motivates and enables smallholders to engage more directly with agribusiness companies? Certainly, above all, smallholders are interested in securing and increasing their incomes.

In general, however, for smallholders to adopt a new practice, it must be unambiguously beneficial—and preferably quickly. For smallholders, labor costs, cash flow, and risk aversion are very real issues that may pose constraints to value chain integration. However, they can link successfully to vertically integrated value chains if they can engage via fair and transparent contracts with processors and other actors (FAO 2017b).

Smallholders who work closely with agribusinesses can

- Raise productivity and improve crop quality;
- Access know-how to mitigate social and environmental impacts;
• Develop farm management skills and bulk up their produce with other farmers to achieve sufficient scale to be effective market players; and

• Meet growing demand for demonstrably safe, sustainable food by improving practices and introducing traceability and certification systems.

Moving Forward: Initial Steps

Taking all the costs and benefits of the business case into account, there is no “one size fits all” solution for strengthening smallholder supply chains. Here, no less than in other business operations, careful planning and program design is needed and will help reduce risk.

This first step entails certain common steps in terms of information gathering, analysis, and design (figure 2). For some firms that have not previously worked with smallholders, some of the specifics of the preparatory work required may be new, though there will certainly be analogous steps in the development of other supply chains. They need to collect information, analyze information, and use that result to inform program design.

FIGURE 2 Steps for Effective Program Design to Strengthen Smallholder Value Chains

<table>
<thead>
<tr>
<th>PHASE 1: PLAN and DESIGN</th>
<th>STEP 1: COLLECT INFORMATION</th>
<th>STEP 2: ANALYZE AND DESIGN</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Perform a sector analysis -&gt;</td>
<td>B. Segment farmers -&gt;</td>
<td>C. Understand environmental and social risk</td>
</tr>
<tr>
<td>A. Prioritize goals and estimate timeframe -&gt;</td>
<td>B. Analyze costs and benefits -&gt;</td>
<td>C. Identify activities based on goals</td>
</tr>
</tbody>
</table>
AGRICULTURAL FINANCE AND AGRIBUSINESSES

KEY MESSAGES

➤ Finance is a useful tool for agribusiness companies to secure their business transactions with farmers.

➤ Business transactions backed by critical insights of farmers can reduce risks and costs in providing financial services.

➤ Financial services can be directly provided by the agribusiness companies and through financial institutions.

➤ Additional services such as insurance and digital payments can improve the efficiency and lower the risk of the transactions.
Access to Finance for Smallholders: The Business Case

Agrifinance is critical to the development of smallholder supply chains. As such, access to finance for smallholder farmers can create a virtuous cycle: Preharvest finance allows farmers to access high-quality inputs, which boost productivity and crop quality while helping ensure a more reliable supply chain for agribusiness companies. Postharvest finance is critical for cost-efficient aggregation of crops. Smallholder farmers themselves are the most significant source of agrifinance. Considering the numerous risks in dealing with smallholders, improving access to additional finance presents an opportunity to make agribusiness companies and their business operations more efficient and resilient.

There are two main ways to deliver such financial services: (a) direct lending by the agribusiness companies, and (b) lending through financial institutions (FIs). They are not mutually exclusive but may complement each other, and other financial services such as payments and insurance are often included to make the business transactions more efficient by controlling transaction costs and managing risks. Agribusiness companies tend to provide funds or inputs on credit for agriculture production to loyal and creditworthy farmers, leaving other farmers and other financial needs to be served by FIs.

Value Chains in Contract Farming: An Overview

An increasing number of firms in frontier and emerging markets have established formal and informal contract farming arrangements to secure a stable supply of crops. From the farmers’ point of view, one of the biggest benefits is a guaranteed market, often with predefined price (or a predefined minimum price to reduce the risk of nondelivery when prices go up) and payment terms.

These arrangements often contain mitigation mechanisms for certain risks associated with the involvement of smallholder farmers, such as side-selling. These built-in mechanisms in the formal and informal contracts reduce key risks for both the agribusiness companies (production risks) and the smallholder farmers (market risks).

Further risk mitigation and cost optimization can be achieved by involving POs in the value chains. Contracting with numerous smallholder
farmers is costly and difficult to manage. Thus, agribusiness companies often contract with POs to source crops in a cost-efficient manner.

Providing finance along value chains—typically by agribusiness companies and other value chain actors to farmers—further smooths the transactions and improves the efficiency of the value chains. Value chain actors such as large agribusinesses, local processors, traders, and input suppliers have always played a significant role in financing commercial farmers, especially in tight value chains. They supply about 40 percent and 13 percent of the short-term financing needs of commercial smallholder farmers in tight and loose value chains, respectively (figure 3). In both chains, value chain actors are the most important sources of short-term funds, followed by formal FIs.

**Direct Lending to Farmers by Agribusiness Firms**

In lending to smallholder farmers, agribusiness companies possess critical advantages: existing business transactions that farmers value, records from past transactions, and often field presence from agents or staff of the agribusiness who can monitor the clients. In some cases,

**FIGURE 3 Sources of Finance for Commercial Smallholder Farmers**

<table>
<thead>
<tr>
<th></th>
<th>a. In tight value chains</th>
<th>b. In loose value chains</th>
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<tbody>
<tr>
<td>Share of financing needs supplied, percent</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Short-term agricultural</td>
<td>40</td>
<td>11</td>
</tr>
<tr>
<td>Long-term agricultural</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td>Non-agricultural</td>
<td>12</td>
<td>9</td>
</tr>
<tr>
<td>Value chain actors</td>
<td>55</td>
<td>55</td>
</tr>
<tr>
<td>Formal FIs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Informal FIs</td>
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</tbody>
</table>

*Source: Initiative for Smallholder Finance.*
*Note: FIs = financial institutions. “Value chain actors” refers to agribusinesses, processors, traders, or input suppliers.*
the smallholders are organized in POs and closely monitored by the agri-
business companies through repeated business transactions.

Well-structured preharvest lending arrangements create incentives
that increase the farmers’ loyalty and reduce side-selling. Finance is typ-
ically provided as inputs on credit, in cash, or both. The debt is recovered
directly, by deducting payments from the farmers at the point of output
sale. Such lending models often include other products and services
such as technical assistance to enhance farmer productivity and ensure
repayment.

**Financial Institution Lending for Smallholders**

When agribusiness companies lend to farmers, it is usually when
farmers lack access to loans from financial institutions (FIs). Formal
FIs, including banks and microfinance institutions, may not be physi-
cally present in the rural areas or may not offer suitable financial
products for lack of strategic interest in the sector or limited sector
knowledge.

The business case is compelling for FIs to lend to smallholder farm-
ers in agribusiness value chains, especially for those FIs already active
in agriculture. By working with agribusiness companies, FIs could lend
to low-risk farmers who have access to reliable markets, possibly with
track records from past transactions. In other words, FIs could reduce
costs and risks by delegating the screening and monitoring of the bor-
rowers to the agribusiness companies. FI lending could also increase
farmers’ access to productivity-boosting benefits such as technical
assistance and high-value inputs. Provision of these services would fur-
ther reduce the farmers’ credit risk and increase cross-selling opportu-
nities for the FIs.

Two broad models cover the numerous ways to bring in FIs to lend to
the farmers in value chains. In the first, agribusiness companies provide
some guarantees or share risks so that FIs could lend to the farmers. In
the second model, FIs take the full risk in lending, but the transactions
are often based on tripartite arrangements between FIs, agribusinesses,
and farmers whereby the agribusiness commits to buy production from
farmers. Additional risk mitigation mechanisms are often introduced
regardless of the models above, typically structured by the development
financial institutions, such as the IFC, that share risks with the participat-
ing FIs.
**Other Financial Products and Services for Smallholders**

Additional financial products and services are introduced in value chain finance arrangements to address residual risks in agriculture lending. Among them, agricultural insurance can help address production risks (such as rainfall deficit or flood) in value chains. Recent developments in digital financial services also enable mobile-based transactions to further reduce the transaction costs, increase security, and capture transaction records more systematically.

Agricultural insurance offers financial protection against agricultural risks, with a double objective: (a) reducing vulnerability ex post in case of shock by providing quick access to liquidity, and (b) increasing productivity ex ante by increasing incentives to invest in agriculture. Insurance overall enables repayment of credit in cases of loss of production and can increase both the demand and supply of credit.

Digital financial services can also play a key role in reducing transaction costs when it comes to financing value chain farmers. Distribution of funds and payments into digital accounts can offer effective solutions to reduce the need for human interface and increase security in the transactions. In addition, these services create a record of transactions and “Big Data” upon which agribusiness companies and FIs could base development of digital scorecards for credit decisions and offer additional financial and nonfinancial products.
AGGREGATION AND WORKING COST-EFFECTIVELY AT SCALE

KEY MESSAGES

➟ Working with smallholders requires aggregation mechanisms to deliver output at volume and provide cost-effective channels for inputs and training.

➟ Producer organizations can be important in frontier and emerging markets, but contract farming, agro-input dealers, and collectors can also help aggregate farmers.

➟ Aggregation choices may be affected by type of crop or product (food or cash, export or domestic market).

➟ Agribusiness is the lead sector globally in terms of numbers of cooperatives.

➟ Financial literacy and business management is often weak in small agribusinesses, but recent work on assessment, training, and accreditation is addressing this gap.

➟ Loans can help upgrade capacity of aggregating organizations or businesses.
Aggregation Options for Reaching and Integrating Smallholders

The very nature of smallholder farming means that a single producer can only supply relatively small amounts of any given crop and that each individual producer has modest input needs. Larger volumes, if to be sourced from smallholders, must necessarily come from multiple dispersed producers, most of whom probably grow their crops in slightly different ways, with considerable varietal variation as well.

Because it is unrealistic for agribusiness firms to directly source from multiple small farms, the firms need mechanisms for accessing the aggregated supply of small producers—whether through contract farmer schemes, producer organizations, market intermediaries, or other channels. Producer organizations (POs) are member-based organizations that enable agribusinesses to efficiently market inputs, procure supply, and convey information between firms and smallholders. As global firms increasingly turn to smallholders as a key part of their procurement and input marketing strategies, the interest in and need to work with well-run POs is unprecedented.

Companies wishing to source in volume from smallholders have six general options:

1. **Purchasing from wholesalers**

2. **Purchasing via established local traders** active in rural areas, possibly facilitated by advancing funds

3. **Purchasing via a lead farmer or agricultural small and medium enterprises** (SMEs), such as agro-input dealers, who collect and purchase crops from other smallholder farmers to generate enough volume to be attractive to commercial buyers

4. **Employing their own field agents** to take on the same roles as the trader

5. **Sourcing crops via contract farming**—a prior agreement to buy a farmer’s crop, subject to certain conditions, which could take several different forms

6. **Purchasing crops from POs**

These options overlap, and several could be pursued in tandem. Business-minded POs are SMEs and thus could be included in option 3. There is also potential for shifts between each “level” as contract farmers, for example, may transform themselves into a PO—or behave like one.
Working with POs seems to offer the most cost-effective long-run strategy to expand the market because as the PO develops into a more professional and commercial operation, it helps to promote and manage that growth while also gradually taking over more of the roles that the firm may play initially. However, working with agrodealers or lead farmers could also be an attractive option—certainly requiring training, coordination, and follow-up but being less interventionist than some other options, with the potential to nonetheless leverage large numbers of farmers.

**Food Crops for Domestic Markets: Implications for Aggregation**

As noted, population growth and urbanization trends mean that future market growth in low- and middle-income countries will be an important driver of agribusiness investment. Urban growth particularly will expand market opportunities for high-value products, affordable traditional food products, and animal-source foods as well as markets for feed and biofuels.

These different products have different implications for aggregation and for the strategies that companies might use to aggregate smallholder supplies. An important consideration is that the food crop and domestic markets—with some exceptions—tend to be less organized than the export markets, with less aggregation and multiple buyers. There is also more scope for household consumption of food crops, and extreme price volatility may result from either very good or very poor harvests.

These factors, combined with weak scope for contract enforcement, create conditions where side-selling is a major risk. This in turn affects ability to advance credit, which affects the scope to upgrade farming practices. The yield gaps underline significant potential to increase yields for the benefit of farmers, consumers, and agribusiness—but for companies to work effectively and grow their businesses under these conditions, they must have robust strategies to manage these related risks.

In the short to medium term, companies may be reliant on existing aggregation points (existing warehousing, for example). They may choose to work with local traders instead of being in direct competition with them. Equally, companies may choose to work with multiple aggregation mechanisms to spread risk and to source more product.
However, if farmers are to be encouraged to produce more and to improve quality, some form of credit will be needed. In this case, it will be necessary to tackle side-selling, which may require a concerted and enduring effort to build farmer loyalty. Under these circumstances, working with POs may be the most effective long-term vehicle to grow the supply base.

**The Business Case for Working with POs**

POs help enable economies of scale in integrating smallholders into global agribusiness value chains, such as in relation to

- *Collecting and disseminating information* for firms seeking certified crops or increased productivity;
- *Strengthening logistics*, with added potential to improve the quality premiums; and
- *Marketing, processing, distribution, lending, and other services*, for firms targeting inputs or financial services to smallholders.

These advantages help to explain why the global agriculture and food sector makes prominent use of cooperatives as a business structure. Globally, agriculture and food is the lead sector in numbers of cooperatives and second (to insurance) in cooperative business turnover (COOP and Euricse 2016).

POs are most useful to firms when they buy inputs and sell crops in large volumes, whether for their own members or for other farmers. In this regard, they fall into several categories, or classes, depending on their level of sophistication—and relative value to an agribusiness firm.

**Best Practices for Aggregation**

Building the capacity of small agribusinesses and POs to be useful partners to companies is an investment. If the aggregator is only needed as an information channel, such as for advice on agronomy or certification requirements, the existing capacity may suffice. However, if the small business or PO is to manage advances or to aggregate or process crops, additional capacity may be needed. Even something relatively straightforward, such as making a payment to a group, may be difficult if the partner does not have a bank account.
To mitigate the risks and ensure a good return on capacity-building investments in POs and other types of small aggregators, several elements are critical:

- **Suitable partnerships.** Before starting, clarify roles and responsibilities through a memorandum of understanding, agree on common policies (such as sanctions for side-selling and loan defaults), and agree on benchmarks for PO capacities.

- **Trust between the partners.** To enable risk assessment and to progressively assume more risk, build trust through clear, sequential steps that develop the relationship (figure 4), taking a long-term perspective to demonstrate commitment.

**FIGURE 4 Phases of Trust and Risk in Partnerships of POs and Agribusiness Firms**

**PHASE 1
ESTABLISHING TRUST**

A firm sends a truck to a producer organization on a particular date, and members deliver their crops for purchase.

- Trust the truck will appear on time
- Trust the agreed-upon price will be paid
- Trust the crop will be the agreed-upon amount and quality

**PHASE 2
ASSUMING RISK**

Producer organization uses its own capital to buy member and non-member crops.

Producer organization obtains bank loan to buy member and non-member crops.

Firms advance funds to producer organizations to purchase farmers’ crops at agreed prices.

- Risk that firm will not buy at agreed-upon price or quantity
- Risk of decapitalization
- Risk that the organization can’t get another loan or loses its collateral
- Risk that the producer organization will not meet the terms of the agreement for volume or quality

**PHASE 3
SHARING INCENTIVES**

Firm and producer organization share the margin between the commodity’s price at farm gate and export. More traceability and higher quality can increase export prices and the margins accruing to firm and producer organization.

Note: POs = producer organizations.
• **Best practices in crop procurement.** Start with groups that have already done business and have secure storage space, establish clear written agreements specifying crop quality and price, establish a dispute resolution process, encourage written record keeping for annual profit-and-loss statements, use automated systems for information gathering and dissemination, and encourage FIs to provide loans or basic supplies and equipment.

• **Adequate financing to upgrade capacity.** In individual loans, require guarantees; in group loans, require an up-front cash contribution (usually 10 percent) as a coguarantee against side-selling or default; for production loans, combine cash and in-kind inputs; follow standard microfinance rules; and consider blended finance (where multiple parties share the loan risk), especially for longer-term investments.

• **Clear planning of the PO roles and responsibilities.** Use supply chain analysis to clarify needed capacities, identify suitable POs (depending on the class of PO required), and designate tasks; and periodically assess PO performance.
KEY MESSAGES

➤ There is an increasing focus on standards that promote improved agricultural practices.

➤ Agribusiness companies are increasingly making prominent public commitments on their social and environmental positions.

➤ These trends are driven by environmental and climate change concerns, consumer demands, food safety compliance, and the wish to avoid reputational damage.

➤ Sustainable sourcing is increasing, including certified areas of key crops, which more than tripled between 2010 and 2015.

➤ Compliance can expand market access but may not deliver higher prices.

➤ Overall production costs can be recouped through productivity gains.
The Business Case for Standards in Smallholder Supply Chains

Standards help firms ensure good agricultural and forestry practices and avoid potential negative social and environmental impacts. They can also highlight potential problems in smallholder supply chains. As distinguished from standards, certification is a mechanism for communicating that a firm has verified compliance with an established standard. Certification can increase access to markets that demand verification of a firm’s good practices.

In recent years, growing market expectations for sustainability drive much of the growth in standards. Particularly, sustainable sourcing—“the integration of social, ethical, and environmental performance factors into the process of selecting suppliers”—has become a key concern for global agribusiness companies. As a result, global brands are increasingly making public commitments about sustainability, especially in relation to labor standards and the environment, and this is driving the way they work with smallholders and the partnerships they form.

Interest in sustainable sourcing became evident in the 1970s and has gradually gained momentum since then. The certified acreage for selected crops nearly doubled between 2008 and 2010, again by 2011, and again between 2011 and 2015. Notably, certified cocoa, coffee, and tea command production shares of 20–30 percent globally, while production of certified cotton, soy, palm oil, vanilla, and sugar is also increasing. For many other products, sustainably sourced crops remain a niche market.

Large agricultural commodity buyers increasingly require evidence of good social and environmental practices in primary production. As this trend gains ground, so too are companies beginning to develop their own standards. Banks, too, may require borrowers to demonstrate compliance with guidelines on social and environmental issues, including community consultation, indigenous peoples, and labor standards. Overall, these trends toward sustainable sourcing—and accountability for it—are driven by consumer demands, food safety concerns, pressure for climate change mitigation, and companies’ desire to avoid reputational risk.

Expansion of Market Access

Verifying compliance with standards and communicating compliance through certification is important for market access. In European markets and increasingly in U.S. markets, consumers have a significant expectation that the goods they purchase have been produced using
good social, environmental, and agricultural practices. Large buyers are increasingly requiring their suppliers to meet labor and environmental standards—making compliance a necessity to meet minimum entry requirements or simply maintain market share.

Firms and farmers who comply with standards may increase their market access but not necessarily price premiums. In complex supply chains, premiums paid by the consumer may be absorbed by downstream retailers, manufacturers, and other intermediaries. Or retailers may determine that the market does not allow for price premiums for any of several reasons: unwillingness to pay premium prices that would have to be passed on their customers; consumer willingness to pay only a scant premium for certified products; or, in markets where certification is expected, increased certified product supply could dilute or eliminate past price premiums.

Costs of Implementing Standards

As with any supply chain investment, the expected benefits of compliance with standards must be weighed against the costs, including the following:

- **Compliance costs**, which are affected by factors such as smallholders’ baseline practices, the existing degree of smallholder organization, the number of smallholder suppliers, the country where the smallholders operate, market demands, and the level of performance required by the standard

- **Certification costs**, including for third-party verification as well as fees for membership in the standards body

- **Cost mitigation for suppliers**, that is, the net value for smallholders (factoring in the farmers’ extra costs, such as additional inputs, labor, or working hours)

Best Practices for Implementing Standards

Firms adopting good practices to implement standards in their smallholder supply chains will benefit from integrating them into their core business activities. As much as possible, firms should build on existing systems and programs. Among those are traceability systems used for
food safety, monitoring of farmer productivity, quality assurance programs, and payment systems—all of which can be extended to add social and environmental verification elements.

Building on existing external programs and groups involving smallholders is another efficient pathway for implementation. Existing farmer field schools and other farmer development programs operated by governments, development agencies, or other NGOs may provide useful synergies and partnerships.

Taking a Stepwise Approach

When production standards among smallholder farmers are significantly noncompliant with the preferred standard scheme, a stepwise approach may be a cost-effective strategy to address buyers’ demands for good environmental and social practices. This can lay out a road map for firms, farmers, and buyers. Firms will need to plan the investment costs and time such an approach will require—and they may have to negotiate with buyers on the compliance time frame.

The first step should be the development of a baseline, indicating the smallholders’ performance against the standard and their organizational status. Interim goals could include setting up an internal control system for the smallholder suppliers and annual targets for the number of farmers receiving training or being included in the verification program. Other interim steps may be to benchmark continuous improvement and set targets for closing out noncompliance.

Implementation could start with a handful of farmer groups, with wider rollout over time. This way, firms may meet compliance or certification requirements earlier with a smaller portion of supply. Alternatively, firms may stagger the rollout of their smallholder program based on key issues. For example, training and verification may focus first on easy wins and proceed to more challenging implementation topics later.

Using Standards to Improve Productivity

Much of the focus here has been on the adoption of standards and certification in response to market demands. However, those standards do not necessarily deliver farm-level benefits. Farming practice standards that deliver productivity benefits are becoming an increasing focus for firms—and this is particularly relevant to smallholder farming, where the yield gap between farmer yield and potential yield is significant (more than 40 percent of current farm yield) (Fischer, Byerlee, and Edmeades 2014).
In some cases, the benefit to farmers is becoming the main driver for the adoption of standards. The costs of compliance with those standards are covered by the productivity gains rather than any market premium. This strategy may also be useful in emerging or intermediate markets where certification is less important.
TRAINING AND COMMUNICATION

KEY MESSAGES

Training is an essential component in any productivity-enhancing strategy, and agribusiness companies sometimes play a significant role in smallholder training.

The content of training programs and management of field staff are being transformed by new information and communication technology (ICT) potentiality, including affordable use of smartphones, Global Positioning System (GPS) navigation, and tablet computers.

Farmer-level volunteers, supported by appropriate incentives, are a cost-effective way to expand extension reach.

Producer organizations, as well as agrodealers and output collectors, are potential conduits for farmer training.

The IFC’s Agribusiness Leadership Program targets farmer organizations, agrodealers, and collectors to improve financial literacy and business management skills.

It is important to include women (who have a significant presence in farming but often achieve lower yields) with proactive tailored approaches to training.
Farmer Training: Strategies and Best Practices

Despite high returns on investment for agricultural extension—in the range of 33–57 percent (Fischer, Byerlee, and Edmeades 2014)—many governments in low- and middle-income countries have reduced expenditures on extension services over the past 20–30 years to control public spending. This has happened even as new challenges and needs are emerging that require stronger, more flexible communication channels in relation to, for example, climate change adaptation and participation in fast-moving global agribusiness value chains.

This need is leading to the development of new training and communication approaches—as well as to a diversification of training providers, whether public, private (farmer-led, NGO, or commercial), or public-private. These now increasingly include agribusiness companies.

Agriculture value chains offer several potential entry points for training farmers:

- Traditional channels via extension workers (government, NGO, or firm) or agricultural training establishments
- POs, which can be both targets of training and enlisted to provide training to their memberships
- Lead farmers or small-scale traders buying local crops
- Local businesses, particularly small agrodealers

Agricultural extension workers, or field staff, are often the first channel that firms think of for a farmer training or outreach program. Although this may permit comprehensive and detailed messaging to farmers, it is also costly—typically $50 to $200 per farmer per year. Written materials and ICT use can reduce the need for extension agents, complement their input, and, in some cases, replace them altogether.

Firms can extend the reach of field staff without significantly increasing costs by identifying lead farmers (also called contact farmers, lead contact farmers, or volunteer leaders) to transmit (or “cascade”) training messages to 20 to 30 farmers. This is sometimes referred to as “farmer-to-farmer” training.

Lead farmers are typically community members with recognized leadership ability who volunteer to convey information from field staff to individual farmers. Effective lead farmers are literate, dynamic community members who have their peers’ respect and are willing to try new techniques. Well-organized farmer groups typically have someone who assumes the role of lead farmer.
Lead farmers can be good representatives of the firm in the community, so it is essential to (a) give them appropriate incentives to play that role; (b) equip them with the knowledge, resources, and capacity to train farmers; and (c) keep track of them.

**Training in Business Approaches, Professionalism, and Markets**

Although most agricultural extension approaches have focused on the production and management of crops and animals, some organizations have focused on the capacity development of POs—addressing issues such as governance, record keeping, legal registration, access to banking, and how to self-organize for training and interaction with value chain stakeholders.

Although farm productivity is important, agribusinesses are also keen to engage with farmers who are already integrated into national markets as suppliers of crops or livestock products and as buyers of inputs. Smallholders who understand the requirements of higher-value or external markets (for example, the importance of quality issues or other product specifications) and how to link with market players make easier business partners for agribusiness firms. For example, the IFC’s Agribusiness Leadership Program and the Bayer Academy in the Philippines are helping farmers become “agripreneurs.”

**Training Materials to Support Field Staff**

Experience is rapidly expanding in using a vast array of emerging ICT options to support farmer training and communication, but there is still a significant place for more traditional media. Effective training tools to support face-to-face group learning include the following:

- **Reference guides for field staff.** These provide the theory behind the staff’s recommendations as well as diagnostic material. Increasingly, guides are available on tablet computers and smartphones.

- **Manuals for farmers.** Farmer manuals are not as detailed as the reference guides. They should be in the local language, use pictures and graphics, and reflect the local context.

- **Flip charts and posters.** Hung in common meeting areas or used during trainings, these useful tools can supplement the trainer’s presentation with pictures and diagrams.

- **Quick reference cards, pictorial guides, and crop-cycle calendars.** Shorter, less dense versions of the manuals include more graphics and can help when farmers’ literacy is low.
• **Video.** This is a popular and effective medium for training farmers individually or in groups with field staff, sometimes using tablet computers provided to field staff.

• **Radio programming.** Radio can reinforce face-to-face training and ensure that consistent messages are transmitted. If they precede the training, farmers can discuss the messages and ask questions.

• **ICT to support group training.** The expanded reach of mobile-phone networks and declining costs of tablet computers and smartphones make the development of applications to support farmer learning a rapidly shifting area of growth.

### Reaching Women

Although women are significant contributors to smallholder agriculture, the yield gap between men and women averages 20–30 percent. Closing that gap would increase agricultural output in frontier and emerging markets by 2.5–4 percent (FAO 2011).

Government extension services have generally performed poorly in reaching women farmers and in the number of women staff they employ. The reasons for this include cultural constraints on women’s mobility away from the home, discriminatory selection criteria for farmers or contact farmers, and women’s multiple roles, which may make it difficult for them to attend meetings at the appointed time and place.

Using female field staff can make a big difference in increasing the number of female farmers and leads in training programs. In certain communities, however, female field staff may need additional training to perform traditionally male tasks. In addition, programs may need to adopt proactive tailored approaches to training of women farmers (Colverson and Mbo’o-Tchouawou 2014).

### Communication to Expand Reach

Communication channels can be broadly grouped into four categories: face-to-face interactions; written materials; radio, television, or videos; and texting, other mobile applications, Internet, and call-in facilities. Firms will find each one suitable depending on factors such as the frequency of communication, its quality, and its reach among farmer suppliers.
The amount and complexity of communication increases as supply chains become stronger and more developed. Basic supply chains may transmit delivery and payment information, while complex supply chains communicate information on crop prices, traceability, training on improved agricultural practices, certification data, product specifications, finance opportunities, and the weather. Figure 5 maps the types of information that firms may wish to convey according to their complexity and impact.

**Mass Media: Print, Radio, and Television**

Mass media are powerful tools for communicating with many farmers at low cost over a wide area, but opportunities to reinforce learning are also needed. Print media, such as agricultural newspapers, can update farmers on market developments and provide timely reminders about good agricultural practices throughout the production calendar. Radio and television can be used in many ways including advertising, discussion programs about crops or products, farmer interviews, and call-in programs.

**FIGURE 5 Types of Information Communicated in Agricultural Supply Chains, by Complexity and Impact Duration**

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<th>Impact duration</th>
<th>Short-term</th>
<th>Longer-term</th>
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<tr>
<td>Complexity of information</td>
<td>More</td>
<td>Less</td>
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ICT to Reduce Costs and Extend Interactivity

ICTs have garnered much interest because they are less costly per farmer than face-to-face communications, can reach large numbers, and present opportunities for reinforcement and impact assessment.

Rapid advances in ICT are creating possibilities that previously seemed scientifically impossible or just prohibitively expensive. These new systems are affecting, or have the potential to affect, smallholder agriculture in multiple ways:

- **Use of the Internet or messaging for agricultural information** relating to standard practices, diseases, treatments, and so on. The more interactive systems can relay messages to call centers and expert input or combine face-to-face interaction with ICT backup.

- **Availability of real-time, local, and customized information**, including market data, weather forecasts, and area or crop surveillance. “Big data” can be used to target training.

- **Lower-cost, wider-reaching technology and scope for more interactive content** are making video, television, and radio more accessible, current, targeted, and effective.
KEY MESSAGES

» Smallholder agriculture significantly underperforms relative to its potential.

» Reducing those yield gaps, through improved farm management and appropriate input use, is one of the most obvious ways to increase global agricultural output.

» Training, input packages, and finance, as well as insurance, can help improve productivity, but there is also a need to extend the reach of input companies.

» New technology supports this goal with off-the-shelf systems to support smallholder management, as well as with its increasing potential for site-specific analysis and recommendations that sharply improve the efficiency of input use.

» Climate-smart agriculture is an important and needed area of development.

» To be adopted, new input packages must be unambiguously better-performing.
Categorizing farmers based on capacity to increase output and use credit—and customizing packages to gradually upgrade farmer capacity—is good practice.

“Reversibility” is a key determinant of agricultural practice adoption that outweighs concerns such as level of investment or expected increase in income—so use graduated approaches.

**The Business Case for Improving Farm Management and Input Use**

In most low-income countries, yield gaps exceed 50 percent—a “yield gap” being the difference between farm yield and potential yield (the yield achievable using existing technology, expressed as a percentage of farm yield). High yield gaps reflect multiple constraints, such as insufficient adoption of more-productive technologies, poor market integration, and gender inequalities in small-scale family farming (FAO 2017b). Closing those yield gaps will require a multifaceted approach that addresses financial constraints; risk management; access to inputs, training, and markets; and infrastructure.

A recent study underlines the importance of farmers’ concerns about risk, finding that the most significant factor in adoption rates of good agricultural practices was the degree of reversibility of the change. In fact, reversibility outweighed considerations such as the level of investment or the anticipated increase in income (Hystra 2015). This finding underlines the importance of stepwise approaches to improved productivity, whereby the change in farming practice is gradual.

Smallholder farmers tend to be low-level users of purchased inputs such as fertilizer, improved seed, and crop protection products, but they use high amounts of labor (predominantly family labor). This results in high land productivity but low labor productivity—making smallholders “efficient but poor” (as, with little land and capital, they try to maximize returns to these factors) (FAO 2014). This affects production in various ways (figure 6).

The low quality of smallholder supply can often be attributed to poor use of inputs—broadly defined to include planting seed, tree seedlings, fertilizer, chemical and nonchemical crop protection products, agricultural hand tools, irrigation products (such as drip systems), and mechanized equipment for production or processing.
Strategies and Best Practices for Improved Farm Management

Some generalized guidelines on strategies have proven successful in improving smallholder farm management and appropriate use of inputs—particularly, improvement of financial literacy and business management skills, agronomic calculations, resource conservation and land use planning, smallholder access to inputs, and new ICT tools.

**Improving financial literacy and business management skills.** Some firms, NGOs, and other entities have developed training materials designed to improve farm management skills and financial literacy among rural households and smallholder farmers. Using these open-source materials or partnering with other organizations are cost-effective ways of providing financial literacy training. This is also the focus of the IFC’s Agribusiness Leadership Program, with its modules tailored for cooperative leaders, crop collectors, and agrodealers.

**Improving agronomic calculations.** All farmers need to know the size of their production area, but in fact, many do not. This makes it impossible to calculate yields or produce useful farm records. Precision is
important in area measurement because errors make it difficult to track typical yield gains of 10–20 percent per year. Moreover, most certification programs require farm maps and production areas, so this is an important aspect of farm management for off-takers to include in training programs.

*Improving resource conservation and land use planning.* The use of farm management practices—such as crop rotation, soil moisture conservation, nitrogen-fixing intercrops, creating windbreaks, using animal manures, and incorporating integrated pest management (IPM) techniques in farm planning—can increase the profitability of smallholder farmers by increasing productivity and reducing costs. Off-takers have demonstrated that assisting smallholders with this type of planning can benefit their suppliers as well as their own businesses.

*Making inputs more accessible to smallholders.* Promoting improved farm management and appropriate use of inputs is not just about changing farmer behavior. In many frontier and emerging markets, input suppliers have a poor presence in rural areas, so they need to extend their reach. The use of agrodealers as a conduit for training benefits farmers and agrodealers alike. Another model is to develop a synergistic service bundle (which, in one example, brought inputs to within 1.5 miles of farmers). Making inputs available in small package sizes is another useful option. To encourage adoption and correct use of inputs, among other important considerations, the input use must be unambiguously commercially viable for the farmer. To reduce the risk of side-selling (and avoidance of loan repayment), one strategy is to customize the packages to farmers’ needs, gradually increasing them as they increase their output, and tailoring the packages to their repayment capacity.

*Using ICT tools to integrate and simplify farm management.* Management software to coordinate outgrower schemes in real time is key for scaling-up. Many companies that aim to go beyond paper and spreadsheets have tried adapting systems for large farms or developing their own solutions. However, ICT systems specifically designed to support outgrower schemes are now available and widely used. ICT systems are now available for extension content and supervision of field agents. In addition, there are systems to support supply chain management and traceability.
WOMEN’S PARTICIPATION

KEY MESSAGES

➤ Apart from compelling development arguments for more equal participation of women in the global economy, there is also an important business rationale.

➤ A body of evidence shows that companies benefit in diverse ways from investing in women as employees, entrepreneurs, customers, and community partners.

➤ Closing gender-based agricultural yield gaps of 20–30 percent would increase agricultural output by 2.5–4 percent in frontier and emerging markets.

➤ Agribusinesses benefit from closing gender gaps through improved quality of produce, better use of inputs, increased farm productivity, more numerous and loyal suppliers, and reduced management costs.

➤ There are also market opportunities in products tailored to women’s needs—and in women-produced products.

➤ Focusing on women may yield opportunities to improve community health and education because of women’s additional roles in these areas.

➤ Gender-specific diagnostic tools and approaches—supported by, for example, more gender-inclusive use of information and communication technology (ICT)—can be used to develop gender-smart agribusiness solutions.
The Business Case for Women’s Participation in Smallholder Supply Chains

The yield gap between men and women averages around 20–30 percent, and most research finds that the gap is due to differences in resource use. Bringing yields on the land farmed by women up to the levels achieved by men would increase agricultural output in developing countries between 2.5 and 4 percent. Increasing production by this amount could reduce the number of undernourished people in the world in the order of 12–17 percent. (FAO, The State of Food and Agriculture 2010–11. Women in Agriculture: Closing the Gender Gap for Development, vi)

There are compelling development and equity arguments for more equal participation of women in the global economy. There is also an important business rationale: women are, after all, half of the potential human capital pool and half of the potential market. Most often cited is the evidence that gender equality strengthens national economies and that strengthening women's presence in senior leadership also strengthens the companies in which they work. These are strong arguments indeed, but they nonetheless understate the numerous and diverse ways in which women’s economic participation is good for business.

Scope for Increased Profit, Growth, and Innovation

The IFC and its partners have been developing a portfolio of evidence on the ways in which—and by how much—women contribute to business growth and how that contribution can be promoted. Some of the more notable findings include the following (IFC 2017b):

- Companies with gender-diverse boards generate a higher return on equity (MSCI 2015).
- Companies with gender-diverse boards outperform those with no women in terms of share price performance during times of crisis or volatility (CSRI 2012).
- High-performing companies are almost 50 percent more likely than low-performing companies to report that men and women have equal influence on strategy development (EY 2015).
- Investors in companies with strong gender diversity strategies receive excess returns running at a compound annual growth rate (CAGR) of 3.5 percent (CSRI 2016).
Companies benefit in diverse ways from investing in women as employees, entrepreneurs, customers, and community partners. Strong evidence supports this argument in three key domains (IFC 2017b):

- **Human capital**: Expanding women’s workforce participation and leadership promotes business growth via its effect on
  
  - *Production quality and output*. For example, ECOM Agroindustrial Corporation saw farm yields increase by 131 percent when it trained both men and women, compared with 95 percent when only men were trained (IFC 2016b);
  
  - *Staff retention, reduced absenteeism, and lower turnover*. For example, investments in childcare and women’s clinics reduced staff turnover by one-third in a Vietnamese factory with which the IFC worked (IFC 2013);
  
  - *Marketing*. A gender-diverse supplier base is a strong selling point in markets with high ethical and sustainable sourcing standards, such as the European Union; and
  
  - *Innovation capacity*. A study of 4,000 research and development teams found that gender diversity “generates dynamics conducive to radical innovation” (Díaz-García, González-Moreno, and Sáez-Martínez 2013).

- **Market growth and innovation**: Because women tend to be the principal decision makers on consumer spending globally (Silverstein and Sayer 2009),
  
  - *Designing and marketing* in response to gender-differentiated customer needs and preferences can produce new ideas or take old ideas in new directions; and
  
  - *Targeting women* specifically, particularly by opening a market previously closed to them, can be a key driver of growth.

- **Operating environment**: Many gender-related challenges that affect the private sector originate outside the workplace. For instance, access to education affects workforce participation, land title (often assigned to men only) affects access to finance, and so on. Companies can influence these sectorwide issues by working in multistakeholder groups.
Women’s Underused Potential in Smallholder Agriculture

The number of female-headed farms is increasing, particularly in Asia, where women head more than 20 percent of smallholder households in some areas (FAO 2011)—an increasing trend where men out-migrate in search of employment. In low- and middle-income countries, the share of women in the agricultural labor force is growing. It averaged 43 percent in 2010 (FAO 2017b) but is higher in many high-value horticulture supply chains. Moreover, among low- and middle-income countries for which data are available, 10–20 percent of all landholders are women, but they are 20–30 percent less productive than men because they have limited access to productive resources, including land, financing, inputs, and technology (FAO 2011).

When agribusiness firms help to close gender gaps by addressing these constraints, they create opportunities to develop stronger supply chains, benefiting the agriculture sector overall (figure 7). Some specific benefits merit more attention—and action—from agribusiness companies:

• **Improved quality.** Women are conscientious with detail at points in the supply chain that can improve quality, such as postharvest handling and identification of pests and disease. They are also strong in cultivating high-value, organic, and indigenous crops (IFC 2016b).

• **Better use of inputs.** Wherever women influence household financial decisions (for example, on input purchase and use), providing training for women increases the likelihood that inputs are purchased and used correctly.

• **Increased productivity.** In certain commodities and sectors, female family members are responsible for most of the field labor. Training women will contribute to improved yields, and more equal sharing of revenues will increase their interest in improving productivity.

• **Increased, and more-loyal, suppliers.** Responsibility for different crops is often gender-differentiated at the household level. Understanding those dynamics can lead to more effective targeting by firms.

• **Reduced management costs.** Female representation in PO management can improve PO efficacy. Female committee members tend to be more willing to share information, help resolve disputes, and represent the interests of the wider membership, whereas male representatives are often unwilling to share too much information.
Increasing Women’s Participation

Understanding how women contribute to value chains and addressing those contributions in supply chain interventions creates value for the firm and for women. To that end, a gender lens can be used at each stage of program design and implementation.

Gender Mapping

Gender mapping is a survey tool that provides insight into women’s roles throughout the production process and along the supply chain. It probes four key dimensions of the gender roles within the household and the farming business:

- **Access**: Does the intervention create opportunities for women to be involved?
• Participation: Are both men and women involved? What explains any differences?
• Control: How are decisions made?
• Benefits: Do both men and women benefit? How? In equal measure?

To answer these questions, gender mapping (IFC 2017a) draws on information from multiple sources, such as questionnaire surveys, key informant interviews, focus group discussions, and analysis of PO membership. The gender-mapping analysis can provide useful insights into women's roles in several areas of the supply chain: farm resources, labor resources, production, postharvest processes, and marketing.

This analysis will highlight issues that may either inhibit or encourage women's involvement. Understanding these issues—and, for example, finding ways to compensate for a negative aspect of an activity that is otherwise positive for women—will be instrumental in any enhanced value chain role for women.

Gender-Inclusive ICT

Because ICT has become particularly important as a low-cost tool that expands the impact of agricultural extension programs, it's important to make the use of ICT tools more gender-inclusive. To that end, firms can follow several recommendations:

• Include a gender component when assessing the benefits of an ICT-based intervention. Men and women may use different types of technology and use them differently.

• Address the ongoing maintenance and costs of the ICT, not just the initial acquisition. For example, a mobile phone needs to be charged with airtime and electricity. If women face mobility barriers, charging a mobile phone can be challenging. Or they may have less income to purchase the airtime and phone-charging services.

• Advocate for gender-balanced staffing at agriculture-related ICT service providers. Female extension agents may find it difficult to travel to remote districts, and female farmers may feel intimidated asking men questions when they contact an ICT service provider. One solution is to hire female agents as call center consultants and operators.
• **Combine ICT interventions with face-to-face learning.** Although mobile services are providing opportunities for reaching large populations, not all women have access to mobile phones or text-based information services. Using multiple approaches ensures that services reach a wider base of rural women in appropriate channels.

• **Use new opportunities with GPS and mobile phones to match service demand and supply.** Women may need agricultural storage, transport, or equipment in smaller measure than their male counterparts, or they may not find it easy to travel far from home, making it harder to purchase or hire these services. A new area of development is the increasing availability of mobile or GPS-enabled services that match dispersed demand with providers.

**Monitoring and Evaluation**

Developing an early understanding of women’s priorities and constraints can inform the development of appropriate outcome and impact indicators for gender. Collecting gender-disaggregated monitoring data will also help highlight areas and issues for further development or adjustment. This allows a firm to ensure that a project attains its overall goals as well as to understand the separate contributions of both men and women. The rapidly changing context for data collection and analysis, including the use of ICT tools, makes it a lot easier to both collect and analyze gender-disaggregated data.

Another tool for monitoring and evaluation (M&E) of women’s participation in agriculture is the Women’s Empowerment in Agriculture Index (WEAI), which was developed to track the change in women’s empowerment as a direct or indirect result of interventions under Feed the Future, the U.S. government’s global hunger and food security initiative (IFPRI 2012). The WEAI measures the empowerment, agency, and inclusion of women in the agriculture sector to identify ways to overcome the persistent obstacles and constraints that limit women’s full inclusion in agriculture.
PARTNERSHIPS FOR SUSTAINABLE VALUE CHAINS

KEY MESSAGES

➤ Partnerships among diverse stakeholders including private, public, not-for-profit, and community actors proliferate in smallholder-based supply chains.

➤ Multistakeholder partnerships help businesses navigate multiple issues that affect smallholder agriculture, bridge cultural divides, manage risks, and address broader sectorwide issues (regarding, for example, labor or the environment).

➤ Maximizing Finance for Development (MFD) is a new approach to crowd in and leverage private sector investment while optimizing the use of scarce public resources to achieve the 2030 sustainable development goals (SDGs).

➤ Partnerships often enable stakeholders to address sectorwide issues that would not be addressed by business without additional support.

➤ Partnerships are often essential for companies seeking to deliver on the public commitments they have made on environmental and social issues.

➤ They also provide a vehicle for the public- and private-good interventions needed to unlock win-win farmer-community-business solutions.

➤ Partnerships can be transaction-cost-intensive, but agribusiness can avail itself of the growing experience on best practices and the key pillars for strong collaboration.
Types of Agribusiness Partnerships

Agribusiness partnerships generally fall into several categories:

- **Commercial partnerships based on contracts or agreements with other single entities.** If such partnerships involve smallholder produce, the business partners may be POs, traders, or other intermediaries. This type of relatively standard business partnership was covered earlier in the “Aggregation” section.

- **Multistakeholder partnerships for value chain or sector coordination.** These partnerships are often mechanisms for multistakeholder collaboration to address important issues that are central to all commercial players and more cost-effectively tackled together (for example, deforestation, upholding labor standards, or smallholder capacity development).

- **Public-private partnerships (PPPs) that involve coinvestment from public finances because of the expected public-good benefits.** Examples include the MFD approach, growth corridors and large-scale commercial agriculture area development programs, food security programs, climate change initiatives, and other issues covered by the UN SDGs.

Multistakeholder Partnerships in Smallholder-Based Value Chains

For many agribusinesses, until recently, the preferred modus operandi would have been to focus on areas of core competence: sourcing from their own plantations or global markets or selling inputs through their own distributor networks. For important linked activities, they could either contract with another provider or take on new roles themselves.

As the drive to source more produce increases, fewer parts of the world have the scope to establish plantations or acquire large tracts of land. Working with other suppliers, including smallholder farmers, is therefore—of necessity—becoming more important in global value chains. Interest in partnerships is a response by firms to the need to navigate this expanding branch of the supply chain. There are private- and public-good benefits to developing those supply chains, with the latter normally outside the purview of a global firm. The pace may seem slow for the firm and perhaps transaction-cost-intensive, but the effort is
worthwhile if it helps secure future supply. In addition, such partnerships are essential for companies if they are to deliver on their public commitments regarding environmental and social issues.

At their best, partnerships promote efficiency gains, allowing each partner to focus on what it does best. Similarly, when firms engage with smallholders, they must tackle issues that can be more effectively addressed in collaboration with other organizations in the following ways:

- Improving smallholder access to training, inputs, and finance in rural areas with weak services and markets is more easily achieved through coordinated actions among businesses, trainers, researchers, local government, and donors.

- Differences of culture, connectedness, business outlook, education, and wealth between globally oriented firms and smallholders in underdeveloped rural areas can give rise to misunderstanding and distrust, creating a need for facilitation by trusted intermediaries.

- Certain challenging issues are most effectively tackled across multiple fronts with different partners, such as concerted action on environmental and labor issues.

- Issues of market failure and free riders (for example, side-selling) can be tackled by actions that coordinate, include, and enforce—underlining the role of partnerships.

- Risk of various types can be reduced or mediated through partnerships (for example, partial underwriting of smallholder income risks via blended finance arrangements).

Public-Private Partnerships for Development

Public-private partnerships (PPPs) are a way to address economic performance and reduce poverty. PPPs for agricultural development will work only if they have both commercial and development value. They generally involve a long-term agreement between government and the private sector in which services are provided to the public (often infrastructure services but increasingly in the social sector, too).

PPPs are relatively new in the agriculture sector. The Food and Agriculture Organization of the United Nations (FAO) defines a PPP for agribusiness development as a “formalized partnership
between public institutions and private partners designed to address sustainable agricultural development objectives, where the public benefits anticipated from the partnership are clearly defined, investment contributions and risks are shared, and active roles exist for all partners at various stages throughout the PPP project lifecycle” (Rankin et al. 2016).

**Value Chain or Sector Coordination Partnerships**

The agricultural value chain is a continuum of diverse actors that play different roles in getting products from the fields to the shelves. Building partnerships along this continuum can strengthen the value chain and help rural households increase their food security and income.

Value chain partnerships may be either formal or informal and may or may not include a financial agreement between the partners. They tend to develop from one or more of the following situations: (a) companies seeking partners to address precompetitive issues; (b) NGOs, researchers, projects, or government agencies trying to link farmers to markets; or (c) government and donor program planning and project identification processes. These partnerships can play many important roles in value chain development:

- Contributing diverse areas of expertise, focus, and networks—hence fostering innovation through coordination and synergies and speeding up learning among different players
- Building coalitions of interest to address difficult sectorwide or multisector issues, including research in needed applied or adaptive agricultural research
- Supporting technology transfer
- Promoting scale by multiplying the resources available (for example, skilled trainers)
- Cutting costs through partner specialization in areas of comparative advantage
- Helping resolve disputes, particularly via an “honest broker” (third-party) role
- Enabling risk sharing, including political risk management
PPPs to Promote Transformative Change at Scale

In recent years, there has been strong and growing interest in large-scale PPPs to transform country or area economies, with public finance to support infrastructure development as well as other activities. These partnerships result from multistakeholder dialogue, consultation, and planning, particularly in the public sector at the early stages (at the country level and internationally). But private sector engagement and direction is key to their ultimate success.

Among the PPPs spearheaded by the World Economic Forum’s (WEF) New Vision for Agriculture initiative (figure 8), Grow Asia and Grow Africa are prominent examples (ASEAN and WEF 2015; Grow Africa 2017). Grow Africa—founded by the WEF and the African Union’s development program, New Partnership for Africa’s Development—facilitates collaboration between governments, international and domestic agriculture companies, and smallholder farmers to lower the risk and cost of investing in agriculture and to improve the speed of return to all stakeholders.

Various mechanisms help fund these partnerships. The World Bank Group created a $2.5 billion International Development Association (IDA) Private Sector Window to catalyze private sector investment, focusing on fragile and conflict-affected states. Another mechanism is the Global Agriculture and Food Security Program (GAFSP), which

FIGURE 8 WEF “New Vision for Agriculture” Initiative

Every stakeholder has a critical role

The scale of the challenge will require everyone to step up their efforts. Governments must lead, setting the direction for their country’s transformation and creating the right environment to achieve it.

Businesses drive implementation through innovation, investment and competition. Civil society mobilizes and supports communities, manages risk, builds local capacity and bridges gaps not addressed by the market.

The companies leading this initiative commit to realizing the new vision for agriculture.

But they cannot do it alone. What will you do?

Source: WEF 2010, 5. © World Economic Forum (WEF). Reproduced, with permission, from WEF; further permission required for reuse.
pools donor resources to fund agricultural productivity programs to reduce poverty and increase food and nutrition security.4 One GAFSP-supported initiative is the Farm to Market Alliance of the UN’s World Food Programme to create markets for smallholder farmers in emerging markets (WFP 2016).

A new partnership model—Maximizing Finance for Development (MFD)—is an approach based on working with governments to crowd in private sector investment while optimizing the use of scarce public resources (World Bank and IMF 2017). The rationale is that the investments needed to achieve the 2030 SDGs are far greater than those available from governments and donors alone. Crowding in more private investment requires increasing the space for private sector activity, improving the policy and regulatory environment, and considering options for using public financing (including blended finance solutions) to improve private incentives and reduce transaction costs and risks. Although these actions can help induce more private investment, there is still a critical need for public resources to finance essential public goods and services such as human capital, agricultural research, and complementary public infrastructure. In the agribusiness sector, the MFD initiatives can focus on areas where the private sector is already investing in agriculture value chains. MFD requires multistakeholder partnerships between firms, financial institutions (including multilateral financial institutions), government, and donor organizations. Such partnerships ensure comprehensive approaches that foster innovation, strengthen markets, and promote competition.

**Best Practices for Building Strong Partnerships**

*Conduct a stakeholder analysis.* In the initial planning stages, this is the process of systematically gathering and analyzing qualitative information to determine whose interests should be considered when developing or implementing a policy or program.

*Understand key elements of successful partnerships.* Pillars of good practice include the following (BIAC 2014): make sure there are mutual benefits, develop clear agreements, identify obstacles, and build in an appropriate level of transparency.

*Minimize transaction costs.* To reduce meeting, traveling, and communication costs, simplify collaboration and meeting agendas, hold informal events, selectively use new communication technologies, and use staff who understand development as well as NGOs.
Establish a dispute resolution process. Anticipate the potential for misunderstanding and attend to areas where this might arise. Roles and funding are common causes of disagreement; there should be agreement concerning confidentiality and intellectual property.

Agree on how risk will be shared and managed. Appropriate mechanisms include insurance, guarantees, subsidized loans, secure purchasing contracts, PO business management training, and provisions in the case of force majeure (Rankin et al. 2016).
MEASURING RESULTS

KEY MESSAGES

➤ Just as firms routinely monitor and measure business performance results, so they must also evaluate their smallholder agriculture supply chain performance.

➤ Companies find it hard to measure development or social impact.

➤ Farm-level impacts are important: farmer well-being is key to supply chain security, and companies can use this to self-promote and account to others, too.

➤ The applications that are transforming agribusiness engagement with smallholders can also provide important monitoring information.

➤ New tools are available that simplify and speed the collection and analysis of field data, including computer-assisted personal interview (CAPI) systems using smartphones and tablet computers.

➤ Income can be measured using rapid assessment tools, including poverty scorecards and a new computer-assisted survey tool called “SWIFT”; such tools are also available to measure food insecurity and diet diversity.
The Business Case for Measuring Results

As with any new initiative and investment—whether commercial, governmental, nongovernmental, or even personal—it makes sense to monitor the implementation to see whether it is working as intended and delivering the anticipated results. The collection and analysis of data is important, useful, and pervasive in business and development practice. Companies often refer to key performance indicators (KPIs).

That logic applies equally to a new development in the value chain. For example, a bank with a new credit line for farmers will want to know whether there has been uptake, whether farmers are paying back their loans, whether the initiative has been profitable, and whether there are prospects for expanding the program. Going a step further—depending on its mandate, business strategy, and perhaps the origin of the fund—the bank will wish to know whether and how farmers have benefited.

The growth of mobile computing capacity and Internet access has fueled expectations about data quality and availability—and if impact can be demonstrated with convincing data, it will attract more attention from senior management. Moreover, agribusiness firms increasingly want to substantiate claims of positive impact on local farming populations. They also need to understand outcomes to reduce exposure to brand-damaging risks, such as from poor working conditions or environmental harm. Independent evaluation findings can underscore a firm’s commitment to sustainability among the broader public.

Monitoring and Evaluation: Process and Impact

A distinction is usually made between “monitoring” and “evaluation.” Monitoring (regular checking) covers such questions as these: Is the program on schedule? Is it meeting its KPIs? Is it proceeding as planned? These data are generally easier to collect because collection is often done through existing systems and processes (and hence sometimes called “process evaluation”).

Evaluation, on the other hand—in particular, impact evaluation—considers bigger questions, generally over a long time frame, requiring careful design to ensure the validity of the results concerning questions such as these: Did the supply chain investments improve crop or
livestock quality and quantity at the times they were required? Does the program deliver significant benefits to smallholders? Has bank lending made farmers good customers for other banking products? Has the program had significant unforeseen side effects (good or bad)?

**Best Practices for Data Collection and Analysis**

**Identify and Plan for Information Needs from the Outset**

The first consideration is to identify what to monitor. Two aspects—how success can be measured and which obstacles might impede success—form the building blocks of a monitoring framework.

To measure change, a baseline is needed. Baseline surveys should be conducted before the intervention begins (though in practice, they are often conducted in the early stages of an intervention). The basic principle is the same: if change is expected in certain variables and the firm wants to measure that change, the information must be collected both initially and at subsequent periodic intervals. Recent developments in rapid assessment tools are simplifying this task.

**SMART** is a useful acronym to remember the nature of good indicators and objectives:

- Specific
- Measurable
- Achievable
- Relevant
- Time-Bound

An example of a non-SMART objective is “to increase farmer coffee yields.” A SMART objective, however, might be “to increase yields of coffee of participating farmers by 30 percent by the end of the 2019/20 season, as measured by sales of green bean equivalent (50 percent processing loss and 12 percent moisture content) in kilograms per hectare.”

**A Logical Framework for Planning and for Measuring Results**

For decades, the development community has used a tool called a “logical framework” or “logframe.” The inclusion of such a framework is
a requirement for many donor funding applications. Developing a good one is not necessarily easy or quick—and it is not a perfect solution—but it nonetheless has some advantages for planning and for monitoring and evaluation (M&E), and it should be developed early in the planning process. The framework summarizes the logic of an intervention—identifying a goal (or overall objective) and planning the lower-level results or outputs to contribute to its achievement, with activities in turn contributing to the achievement of each of those outputs.

Choice of metrics. The hierarchy of logic in the framework mirrors the nature of the M&E data required: at the lower level, activities are monitored, whereas at the higher level, the broader questions are in focus. The term “metrics” refers to what will be measured. Figure 9 shows how the appropriate choice of metric changes, depending on the level of achievement described. For each level of achievement, the metric should closely describe what is expected to happen. Choosing the right metrics for the logframe can be essential to ultimately improving the business’s practices.

Data sources. There can be many sources of data, and it is not always necessary to conduct in-depth surveys. Useful information may be contained in the firm’s own records; POs or farmers may keep (or be encouraged to keep) certain records; local information may be available from the district authority or from surveys conducted by other organizations; and information may also be available from satellite imagery, drones, or remote sensing.

Results Measurement

Monitoring

Most agribusinesses will already have appropriate systems for collecting and analyzing routine monitoring data, perhaps including digitized
MEASURING RESULTS

systems. When agribusinesses work with smallholders for the first time, existing tools may need to be adapted—particularly if the field agent is to play a greater role in collecting and verifying farmer data—because smallholder farmers’ own records are likely to be poor.

Many suitable off-the-shelf systems now support the operation and management of agribusiness value chains with smallholder suppliers. Examples of farm management software include Cropin SmartFarm, FarmERP, Farmforce, SAP Rural Sourcing, and SourceTrace. Firms may also collect data to check for compliance with standards and certification. For this, digital systems are available that can dramatically reduce costs.

Impact Evaluation

There is no single one-size-fits-all methodology; the approach used depends on the scope of the evaluation; how the information will be used; the complexity involved (such as the extent to which multiple factors must considered); the resources (including the skill set) available; when the results are needed; and the degree of reporting rigor required (depending on, for instance, whether the firm wishes to make public claims about its achievements). In rural societies, where obtaining accurate data can be difficult and multiple factors affect outcomes, evaluations often combine multiple methods to better understand processes and outcomes.

If firms lack specific in-house expertise in evaluation, they should seek outside expert advice. And if the firm wishes to make public statements based on such investigations, the use of independent external evaluators will underscore the impartiality and validity of those results.

Farm trials can be used for impact evaluation. Randomized control trials (RCTs), sometimes used in an evaluation, seek to compare participant outcomes with the outcomes of nonparticipants. The results may enable the firm to make a claim attributing changes in the participant outcomes to a project, program, or intervention. However, undertaking RCTs in agriculture can be challenging and costly because large sample sizes (as many as 400–500 farmers) may be needed in each group to ensure statistical validity.

Impact Metrics for Smallholder Supply Chain Interventions

Number of farmers reached. The most aggregated and basic metric a firm can use is the number of farmers who participated in a supply chain
intervention. For firms with multiple interventions affecting farmers across various sectors using diverse methodologies, this metric provides a single summary indicator of the scale of the firm’s work with smallholders.

Productivity gains or losses. Most farmer training programs intend to increase productivity (for example, tons of wheat per hectare, tons of fish per unit of pond area, or liters of milk per cow). Firms building traceable supply chains usually want to determine their suppliers’ productivity to forecast crop procurement and calculate farm income.

Crop quality. As with prices, firms collect data on the quality of the crops they purchase. These data can be used as part of impact measurement. The challenge is to maintain the data in a form that facilitates program design and helps to measure the training results.

Farmer income. Reliably tracking farmer incomes is challenging but important. If new practices or inputs do not improve household well-being, farmers are unlikely to keep using them. Yet they rarely keep track of the costs associated with growing each crop, and their self-reported information on net income may not be reliable. Standard monitoring systems (further discussed below) will enable calculation of net revenue (output purchases net of input costs) per farmer or per unit area of crop and allow that metric to be tracked over time.

Tools for Data Collection

Until recently, surveys were conducted using small armies of enumerators, equipped with clipboards and forms. The information collected was subsequently input into a computerized database, which could then be analyzed to generate information and answer specific questions. Enumerators today are much more likely to use tablet computers or even smartphones. Surveys are conducted directly by phone, too, often by automation. GPS coordinates can now identify a farm or a field, making repeat visits and follow-up easier. Questions about farm size and yield can also be supported with the use of GPS tools.

Standard Farm Management Packages for Monitoring Data

As digital technology becomes more ubiquitous in everyday tasks, firms can access important monitoring data in real time. Field agents regularly
record information. Companies track input sales or crop purchases and use GPS or smartphone apps and software to monitor the day-to-day activities of their field teams, generating real-time analysis and graphics. The collection of georeferenced data is also important because it permits spatial analysis.

These tasks (data collection, analysis, and the development of recommendations) are being transformed by smartphones, tablet computers, and faster Internet with wider reach, combined with rapid software development. In addition, there is now scope to interface with landscape data derived from remote sensing or drone surveillance, as well as with site data captured via handheld devices (for example, for soil and water testing).

Standard systems for supply chain management and traceability will, for example, allow entry of basic farmer identity information, address, plot size, and so on; track farmer use of inputs and cost of inputs; show sales of output per unit area; and record payments to the farmer. Many standard systems include the option to customize data collection and surveys—to address issues that fall outside the standard list of variables.

**Survey Tools to Measure Farmers’ Household Income**

Large household surveys can be used to collect data on household consumption, which is a proxy measure for household income (as in the World Bank’s Living Standards Measurement Study [LSMS]). Their purpose is generally to understand income patterns and trends in a large area or across an entire country (showing differences among different household types or areas, changes over time, and so on) but not to monitor an individual household’s well-being.

Alternatively, the Survey of Well-being via Instant and Frequent Tracking (SWIFT) was developed by the World Bank Group to estimate household income and expenditure data in a cost-effective, timely, and user-friendly manner (World Bank, n.d.). Questions and reporting can be tailored to the client’s needs, but a typical output would be a short report with graphics of 5–10 pages (figure 10). SWIFT can be used to collect socioeconomic baseline data or to answer specific questions. For example, one firm wanted to know whether side-selling was associated with poverty. The survey established that there was indeed a link and was able to use the information to adapt its approach to reduce side-selling.
Poverty scorecards are another simple, quick tool that assesses whether households are above or below a poverty line (either a national poverty line or an internationally accepted standard) or even a program target. A score is generated based on the responses to a short set of questions that probe characteristics of the household and the things they own, tailored to local circumstances. This information can be used to target services or interventions.
Survey Tools to Measure Food and Nutrition Security

Food security is a key concern among low-income groups, including smallholder farmers. Changes in farming practices can affect food security unpredictably. Land may be diverted from food crops to cash crops, but increased income may not necessarily be used to meet food needs. It can be important to consider the food security impacts of an agricultural program and build in mechanisms to ensure positive outcomes.

To measure diet diversity, the IFC has adopted the Food Consumption Score (FCS) tool from the United Nations World Food Programme. Before implementation of the baseline survey, the consultant firm (in consultation with the IFC and its client) will be required to provide localized food examples for each of the dietary categories mentioned in the FCS tool (WFP 2008).

To measure food insecurity, IFC projects rely on the Food Insecurity Experience Scale (FIES) developed by the FAO. The instrument incorporates eight key questions, which may be available in local languages on the FAO website along with additional information to help enumerators.

Qualitative Approaches Including Participatory Rural Appraisal

Qualitative methods are generally better at teasing out cause, process details, and variation within a group (for example, farmers describing the factors that affect their maize yields). With qualitative methods, enumerators use checklists and a set of tools and skills to elicit information. They include focus group discussions; key informant interviews; case studies; direct observation (for example, walking along a transect through a village and systematically recording certain types of detail); and other methods.

Computer-Assisted Personal Interviewing Systems

Quantitative surveys can now be supported and conducted using computer-assisted personal interviewing (CAPI) systems, including survey options available with supply chain management systems (such as Farmforce). These systems use handheld tablet computers or smartphones, eliminating the need to manually transfer data to a database, speeding up review and analysis, and reducing human error.
Choice of Data and Methods: Be Judiciously Pragmatic

It is often difficult to measure exactly the variable of interest—and to try to do so would be costly, with no guarantee of success. Smallholder income is an obvious example. Impacts may also take time to emerge. A scorecard measuring change in household assets may not detect immediate change because there may not be immediate change.

Often, the best option is to try to understand outcomes and results by considering a number of different measures and what they mean when taken together. That implies choosing measurable metrics and mixing methods—particularly combining qualitative and quantitative approaches—to both measure and explain.
FUTURE OUTLOOK

KEY MESSAGES

➤ The agribusiness sector directly affects 8 of the 17 Sustainable Development Goals (SDGs) and has relevance to all the other SDGs.

➤ Population growth and urbanization are driving significant changes in food markets in low- and middle-income countries.

➤ Smallholders will take on growing importance in agribusiness supply chains, where the roles of women and youth are likely to expand and help transform the sector.

➤ Farmers will become more professional with stronger links to local and international markets.

➤ Global firms will be able to identify suitable rural business partners (producer organizations and other entrepreneurs) who meet accepted business standards.

➤ Climate-smart agriculture is a growing focus and needed for both climate change mitigation and adaptation.

➤ Technological advances are contributing to climate-smart solutions, simultaneously opening an astonishing menu of precision agriculture options—possibly even at the smallholder level.
Technology is also transforming the possibilities for agribusiness to engage with smallholders—making traceability easier, reducing the cost and time required for communications and advisory input, making coordination easier, and opening new ways to aggregate dispersed smallholder output and demand for inputs.

Parallel developments are improving the affordability of index-based insurance, in which there is increasing interest in the context of climate-change-related risk.

Insurance nonetheless remains expensive, but take-up is expanding, supported by strategic “smart” public subsidies.

Interest in healthy, nutritious, and safe food will continue to be an important focus.

Strong partnerships will drive the development of more resilient and inclusive agribusiness to meet the food and socioeconomic needs of future populations.

**Force Majeure: Challenges to Feeding the World in 2050**

A convergence of economic, demographic, and environmental concerns has focused attention on how the world will feed itself in 2050. Volatile food prices since 2007 have underscored the fragility of the global food system after a 30-year period of relative stability. The world food crisis of 2007–08—followed quickly by further price rises and compounded by growing concern about climate change, competition for agricultural resources from biofuels, and degradation of environmental resources—exacerbated concerns about world food supplies.

Add to these exigencies the persistence of poverty and hunger, particularly among the rural poor in low- and middle-income countries. Malnutrition has also become a concern, in different ways, for both the poor and the less poor. Further pressure comes from youth unemployment and underemployment, including whether agriculture and agribusiness can provide sufficient (and sufficiently attractive) work for a large part of the world’s expected 1.2 billion youths (ages 15–24 years) in 2050.

In the face of all these conditions, an unprecedented coalition of interests—across and within countries and regions, in commerce, in government, in the not-for-profit sector, and among very different
disciplines and sectors—has emerged to address the challenge of meeting the food needs of 9.8 billion people in 2050 (UN DESA 2017). The agribusiness sector has potential for wide-reaching development impacts. It directly affects 8 of the 17 UN SDGs for 2030, but it can contribute in all 17 areas (FAO 2017a).

This section looks at the key trends that will influence how firms engage smallholders over the coming decades, to build resilient agricultural value chains and meet the needs of future populations.

Food Market Growth and Change in Low- and Middle-Income Regions

Although population growth has slowed in most higher-income regions, it is still increasing in the low- and middle-income regions, where most of the additional 2.2 billion people in 2050 (compared with 2015) will live, especially in Asia and Africa (UN DESA 2017). Some countries will see especially steep population growth: for example, the combined population of 12 Sub-Saharan African countries—320 million in 2015—is expected to double by 2050 and to double again by 2100 (FAO 2017b).

Moreover, with increasing urbanization, the global population increase will be seen mostly in urban areas, where an additional 2.4 billion people will live by 2050 (FAO 2017b). (In contrast, the global rural population will show a net decline of roughly 200 million people in 2050 compared with 2015.)

Wide geographical disparities in income will also continue. This means that low- and middle-income regions will have large low-income urban populations. “Business as usual” investment would leave an estimated 650 million people (8 percent of the global population) undernourished in 2030 (FAO 2017b). This projection drives much of the interest in public-private partnerships and other means to increase supplies of affordable food, particularly for poor urban populations.

Along with these trends, the structure of the food industry is also changing—toward more vertical integration. Smallholders can benefit from these shifts wherever there are fair contracts between processors and producers. Those links are most effective where there is good infrastructure and increased professionalism as well as strong POs and related institutions (FAO 2017b).

Add to this the increasing focus on food safety, healthy foods, and nutrition. Reducing the triple burden of malnutrition (hunger, micronutrient deficiency, and obesity) and ensuring food safety will remain
important concerns. Biofortification of crops and food is likely to grow in importance. Agribusiness firms will be under pressure to show that they are delivering in these areas—be it by providing safe and healthy food or by the impacts of their value chains on food producers in frontier and emerging markets.

**Potential for Climate-Smart and Precision Agriculture**

**Climate-Smart Agriculture**

Fueled in part by many decades of escalating greenhouse gas (GHG) emissions worldwide, climate change is causing shifts in temperature and rainfall patterns and increasing the intensity and frequency of extreme weather events. Adaptation to these changes requires new agricultural practices, new varieties, and even new crops—as well as new risk management strategies.

Climate-smart agriculture (CSA) is an integrative approach aimed at increasing productivity sustainably and ensuring food security by building climate resilience and reducing GHG emissions from agriculture.

Many agribusiness firms are setting carbon-neutral or carbon-positive targets, and the IFC is supporting their commitments through investments and advice. Certain agribusiness sectors present opportunities for CSA and smallholders, particularly in relation to the annual and perennial crop sectors identified in figure 11 (IFC 2016a).

**Precision Agriculture**

Precision farming is a relatively new management practice which has been made possible by the development of information technology and remote sensing. Precision agriculture entails the application of technologies and agronomic principles to manage the spatial and temporal variability associated with all aspects of agricultural production—both crops and livestock. In particular, precision farming, defined as a systems approach to optimise crop yields through systematic gathering and handling of information about the crop and the field, has the potential to contribute to nutrient management by tailoring input use and application more closely to ideal plant growth and management needs. (OECD 2016, “Farm Management Practices to Foster Green Growth”)

Technological advances are revolutionizing analytical capacity as well as its granularity, cost, speed, and communicability—particularly in
relation to communications (satellite and cellular); surveillance (drones and satellites); microtechnology for testing, monitoring, and mapping (handheld devices for soil, water, and leaf nutrient analysis as well as sensors and GPS navigation); and powerful computing capability (centralized and portable) supported by software development. It may not be easy for smallholders to participate in all aspects of this agricultural revolution, but as an example, handheld soil-testing devices are already being tried out with smallholders.

These developments in information and communication technology also help provide timely, localized, and objective data and maps on which weather-indexed insurance products can be developed and refined. A new subscription service (MUIIS—for Market-Led, User-Owned, ICT4Ag-Enabled Information Service) even provides smallholders with a package combining real-time satellite data with a weather-indexed crop insurance policy (Camp 2017).
Smallholders: Standardized, Market-Integrated Business Partners

Rapid population growth in frontier and emerging markets, high incomes, and urbanization as well as improved infrastructure and technological advances are all contributing to the improved market integration of smallholder farmers—be they linked to domestic markets, where there has been transformation in recent years, or to global value chains.

An interesting new development, still at an early stage (and discussed earlier in the “Standards” section), is to independently assess and establish a standard for the professionalism of farmers’ organizations as well as other rural entrepreneurs such as agrodealers and crop collectors, based on their financial literacy and business management capacity.

In addition, women’s roles in agribusiness are receiving increasing attention—and in some regions, rural male outmigration is leading to the increasing feminization of agriculture. Firms are increasingly recognizing the considerable role that women play in supply chains as well as the specific areas in which women excel and can contribute more.

With this recognition comes increasing adoption of gender-smart approaches that address the inequalities that women face in access to the resources they need to improve their productivity. This is likely to be a growing focus over the coming decades.

Sector Transformation

Sector transformation is a new area of interest, emerging in response to a concern that smallholder performance often reaches a certain level of development that can be driven by the market but shows insufficient capacity for the self-renewal needed for ongoing growth and adaptation.

Sector transformation approaches are a logical “next step” on the continuum to more professional, sustainable smallholder production in global agribusiness supply chains. In a sense, they combine the ambition of traditional government-led sector development programs with strong market integration, as characterized by strong, functional partnerships of public and private sector stakeholders; demand-driven services; complementary sectorwide investments and regulation; and sectorwide monitoring and learning.
The ultimate goal, and shared interest, of these different stakeholders is to build resilience in global food supply chains to meet the needs of the world’s population. Working with smallholders is just one way in which agribusinesses are rising to that challenge. The IFC, in its work with private firms, aims to support that process with this handbook as one among many initiatives.

Notes

1. A smallholder farm is widely defined as a family-owned enterprise that produces crops or livestock on 2 hectares or less. In some countries and sectors, smallholdings can exceed 10 hectares, and there is considerable variation in how countries define smallholders or categorize farms. The key factor is a limited asset base.
5. For more information about the FIES instrument, including available languages and other information to help enumerators, see “Using the FIES” on the FAO Voices of the Hungry website (accessed July 8, 2017), http://www.fao.org/in-action/voices-of-the-hungry/using-fies/en/.

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