

# FIELD Report No. 18: Smallholders and Inclusive Growth in Agricultural Value Chains

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# FIELD Report No. 18

## Smallholders and Inclusive Growth in Agricultural Value Chains

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# Executive Summary

Inclusive market development promotes economic growth with poverty reduction by facilitating the integration of large numbers of micro- and small enterprises into competitive value chains. The strategy of inclusive growth has strong appeal in agriculture, where a successful smallholder-led strategy for inclusive growth can precipitate a structural transformation that increases productivity, incomes, and food security in rural areas. Upgrading, which is defined in terms of increased productivity and efficiency, plays an essential role in bringing smallholders into higher value markets because it increases smallholder contributions to value added.

This paper investigates inclusive growth in agricultural value chains, with a focus on smallholder participation, upgrading behavior, and outcomes related to agricultural productivity, agricultural profits, and smallholder incomes. The purpose of the paper is to advance understanding of inclusive growth by reviewing empirical evidence from twelve agricultural value chains that have engaged and benefited smallholders. The review of evidence focuses on three central questions:

1. *Inclusion*: To what extent have smallholders participated in agricultural value chain projects? What are the different types of project outreach to smallholders?
2. *Upgrading*: Have smallholders been willing and able to add value by upgrading? What kinds of productivity effects have been observed under what conditions?
3. *Benefits*: Are smallholders able to capture some of the additional value that they create through upgrading? Do smallholders and their households receive income benefits from their participation and upgrading investments?

## ***Smallholders in Agricultural Value Chains***

Background concepts from both USAID's value chain framework and the literature on smallholder household economics are reviewed in Section II. The structural and dynamic elements of the value chain framework are described and illustrated using the example of Guatemalan high-value horticulture. Smallholders' decisions to participate in new markets and invest in upgrading are made from their position at the interface of several systems, including agricultural value chains and farm household economies. Household-level investment decisions are embedded within the overall allocation of household resources—land, labor, capital—among alternative production, consumption, and investment activities. In Section 2.3, smallholder decisions are modeled as behavior changes made in response to triggers that come from real or perceived changes in market opportunities and/or household capabilities.

## ***Evidence on Smallholder Inclusion***

The information reviewed in this study is taken from twelve agricultural value chains in ten countries: Armenia, Bangladesh, Ghana, Guatemala, India, Kenya, Nigeria, El Salvador, Tanzania, and Zambia. Horticulture and smallholder dairy, along with agricultural inputs, are the most

common value chains included in the review. Most of the cases represent donor interventions to promote inclusive value chain development, including projects funded by USAID, MCC, DFID and the Gates Foundation. The evidence for this study is drawn from monitoring data, independent impact evaluations, cross-sectional, and cross-country research. Information for two cases not associated with a donor project is provided by cross-sectional studies. Table 1 (p. 12) lists the twelve cases, indicating country, value chain, project information, and type of evaluation or study reviewed.

The evidence indicates that relatively large numbers of smallholders are being reached by many of these value chain projects. Due to inconsistencies in the ways that projects define and measure outreach, however, the participation results are not necessarily comparable. The level of smallholder outreach reported by each project is indicated in Table 2 (p. 14), which uses three distinct categories of beneficiaries:

1. *Direct contact entrepreneurs* interact with project-funded personnel, activities, or materials, such as by participating in a project-run training course or by receiving improved inputs as part of project facilitation activities.
2. *Indirect contact entrepreneurs* are linked to direct contact entrepreneurs through their commercial relationships in the value chain and its supporting markets.
3. *Imitator entrepreneurs* are reached through imitation of successful new practices and business models. These are also known as spillover, diffusion, or demonstration effects.

Only the project in India provided information on the number of imitator firms. In that case, the spillover effect was estimated to be more than four times the size of combined project outreach to direct and indirect contacts.

### ***Evidence on Smallholder Upgrading and Benefits***

Smallholder upgrading is at the core of inclusive value chain development because upgrading adds value by improving efficiency (process upgrading) and/or product quality (product upgrading). As measured in terms of smallholder adoption and continued use of new inputs and practices, results in Table 3 (pp. 16-17) indicate smallholders are willing and able to upgrade. Upgrading examples found in the cases include the use of improved seeds, fertilizers, services (e.g., spraying, artificial insemination), irrigation, new crops, and new production technologies.

Alternative approaches for evaluating smallholder upgrading include measuring outcomes in terms of physical yields, unit production costs, product prices, and enterprise profits. As can be seen in Table 3, results for these measures are mixed. Findings from program monitoring data tend to be more positive than findings from impact evaluations, as might be expected given that impact evaluations involve a higher burden of proof. In addition, unexpected changes in the broader context within which an intervention takes place, such as sudden changes in macroeconomic, regulatory, market, or weather conditions, can exert an influence on smallholder upgrading behavior that far exceeds the influence of project interventions.



The combined participation and upgrading results suggest that project interventions focused on facilitating inclusive changes in markets for agricultural inputs and services have greater initial outreach and report consistently positive upgrading results. All of the projects reporting project outreach in excess of 100,000 smallholders placed a heavy emphasis on improving agricultural inputs and input markets. Some of the best outreach and upgrading results were reported by projects that worked with large input suppliers to reach smallholders through networks of rural sales agents.

### ***Value Capture, Farm Income, and Household Income***

Given that smallholders participate in higher value markets and improve their products and processes through upgrading, the third outcome of concern is smallholders' ability to capture some of the additional value they create. The value captured by a smallholder is equivalent to enterprise profits, or sales revenue less the costs of production (net revenue). Keeping in mind that smallholder households typically have several income generating activities, including a number of different crops, then an increase in profits from one enterprise only translates into an equivalent increase in household income so long as it does not reduce profits from another enterprise. So, while value capture is defined in terms of enterprise profits, increased enterprise profits may not translate directly into identical increases in household incomes.

The evidence on smallholder value capture is summarized in Table 3 (pp. 16-17). While information on value capture is not provided for several cases, those that do report farm or household income paint a mixed picture. From India and Zambia, studies based on similar research designs, the results were either inconclusive or show no statistically significant impacts on income. The Nigeria evaluation found increases in household net income, measured in terms of agricultural profits, based on estimates from the project's monitoring and evaluation data. A longitudinal evaluation that included smallholders participating in the KMDP, KHDP, and KDDP projects (all in Kenya) found that poverty rates for direct contact participants fell significantly faster than did poverty rates for smallholders in control villages.

There is not enough evidence to make a general statement about the empirical relationship between participation in agricultural value chain projects and poverty reduction among smallholders. This conclusion is highlighted in an MCC report, which summarizes findings from its first five impact evaluations of agricultural projects (MCC 2012). While three of the five MCC evaluations of smallholder training programs reported strong evidence for impacts on enterprise income, none of the evaluations found evidence for impacts on household incomes. The authors suggest a number of possible explanations, including the likely explanation that not enough time has passed for these late-stage changes to occur. In addition, they conclude that evaluators need to place greater emphasis on understanding the program logic and timing and relationships between the components of a value chain development project. Other authors have described inherent features of value chain projects that create significant evaluation challenges (Creevey et al. 2010).

### ***Implications and Conclusion***

It seems clear from the review that relatively large numbers of smallholders can be reached through market systems facilitation projects. In addition, smallholders exhibit a willingness to



upgrade in order to increase agricultural productivity. As might be expected, willingness to upgrade is predicated on smallholders' perceptions of market opportunities and household capabilities. The review found limited evidence that smallholders are able to earn higher profits from their upgraded farm enterprises. However, impact evaluation results indicate that positive impacts on enterprise income do not necessarily imply positive impacts on household income.

There are several types of investments that donors can make to facilitate the development of inclusive agricultural market systems:

- Facilitate increases in the quality and types of information available to smallholders. The information that smallholders need to evaluate alternative market opportunities includes general market and price information, as well as specialized technical information on production and post-harvest handling. In addition, smallholders need information on end market specifications, with a common channel for this information being through vertical linkages to buyers and/or input suppliers. In order to build inclusive market systems, it is important to address information bottlenecks and facilitate the unobstructed flow of market and technical information to smallholders.
- Develop and facilitate scale-appropriate agricultural technologies and input packages. National and international agricultural research efforts should focus on productivity enhancing technologies that match smallholders' resource and risk profiles. It is important to keep in mind that agricultural intensification is not a universal solution. Where there are high population densities and extremely small farm sizes, rural households will need alternative employment and enterprise opportunities.
- Make investments that benefit large numbers of smallholders. Improvements in infrastructure, communications, and the regulatory environment have widespread benefits. Improved roads, power, transportation, irrigation, and cold chain storage systems can help to reduce costs and improve profitability for smallholders and their commercial partners. Advances in information and communication technology can also lower costs, especially the costs of obtaining market and technical information.

There are a number of weaknesses in the approaches currently being used to monitor results and evaluate the impacts of inclusive agriculture projects. Until these methodological issues are addressed, there will be serious gaps in knowledge about the scale of outreach from market systems development projects and the level of benefits that participating smallholders receive. Two specific types of improvements are recommended:

- Improve and standardize indicators for smallholder outreach under facilitation projects. There are no generally accepted methods for identifying and measuring the three types of project participants that are reached through market systems facilitation: direct contact, indirect contact and imitator entrepreneurs. Lack of comparability in participation data reported across projects will continue to be a problem until more consistent methods are followed. Implementing organizations sometimes struggle with measuring indirectly participating smallholders, and when it comes to imitator firms associated with spillover effects, there is very little information. Conceptually, the

number of smallholders reached through spillover effects could be several times larger than the number reached directly and indirectly, but we lack data to test this hypothesis.

- Improve approaches for evaluating impacts on income from inclusive growth projects. One problem is that impact evaluations are too short to capture income effects. Longer evaluation time horizons, including post-project observations, are needed. A second problem is failure to acknowledge the role of smallholders as both producers and consumers of agricultural products. This is related to such issues as household food security, household income diversification, intra-household resource allocation, and the fungibility of capital. A more nuanced approach might help to resolve the third issue, which is the puzzling gap between positive impacts on enterprise income and lack of impacts on household income. Fourth, evaluators need to understand the logic underlying market facilitation projects so that evaluation designs fit roll-out schedules and reflect the synergistic influence of interventions at multiple levels of the market system. Finally, attention should be paid to measuring the full impacts of these projects by counting benefits that accrue beyond smallholder households, such as impacts on rural food and labor markets, as well as multiplier effects resulting from the circulation of increased expenditures in the local economy.

With inclusive market development, the goal is to promote economic growth with poverty reduction by facilitating the integration of large numbers of micro- and small enterprises into competitive value chains. The recent development experiences reviewed in this paper indicate that smallholders can play a significant role in competitive value chains, so long as they have the requisite capabilities, profitable opportunities, and the information they need to accurately assess their alternatives. In addition, there are significant steps that governments, development practitioners, and for-profit firms can take to promote inclusion, by building smallholder capabilities, facilitating improved market opportunities, and improving the quality of information available to smallholders when they make their decisions. Finally, it is important to keep in mind that decisions about market participation and upgrading are made by smallholders themselves, based on their understanding of their own best interests.

*In many places, people live on little more than a dollar a day. So the United States will join with our allies to eradicate such extreme poverty in the next two decades by connecting more people to the global economy...*  
President Barack Obama, State of the Union Address, 2013

# I. Introduction

Inclusive growth is an important component of USAID's economic strategy for addressing global poverty and hunger. Defined as economic growth that reduces poverty, inclusive growth incorporates low-income households and individuals into growing economies and market systems. In agriculture, inclusive growth means developing the agricultural sector in a way that generates broad-based benefits for rural populations while improving economic productivity and food security at the local and national levels.

The strategy of inclusive growth has strong appeal in agriculture, where the benefits from harnessing agricultural resources to the economic development process have been recognized for some time (Johnston and Kilby 1975, Mellor 1976). More recently, USAID's Feed the Future Initiative has reaffirmed the importance of investing in smallholder agriculture, a focus area in their approach for creating inclusive economic growth and enhancing food security in developing countries:

*There is broad consensus that reducing global poverty and hunger requires accelerating growth in the agriculture sector...Feed the Future strives to increase agricultural production and the incomes of both men and women in rural areas who rely on agriculture for their livelihoods. Investments in inclusive agriculture-led growth encompass improving agricultural productivity, expanding markets and trade, and increasing the economic resilience of vulnerable rural communities. Feed the Future seeks to unleash the proven potential of small-scale agricultural producers to deliver results on a large scale.*

[www.feedthefuture.gov/approach](http://www.feedthefuture.gov/approach)

By integrating large numbers of small-scale agricultural producers into competitive value chains, a successful smallholder-led strategy for inclusive growth can support a structural transformation of the agricultural sector. The benefits of such a structural transformation include increasing incomes for smallholders, as well as multiplier effects on employment and income throughout the rural economy, reducing poverty, improving food security, and fueling a process of local and national economic growth.

Upgrading, which is defined in terms of productivity and efficiency, can play an essential role in bringing smallholders into higher value markets. When smallholders invest to increase their own productivity, this can have a positive effect on competitiveness for the entire value chain. Higher productivity, coupled with the ability to adapt to changing market conditions, help smallholders become more attractive commercial partners to larger firms in the value chain.

While upgrading (by definition) creates additional value, smallholders must capture some of that additional value in order to benefit in the form of additional household income.

Smallholder upgrading represents a series of investment decisions made at the interface between market and household systems. Market systems offer demand-driven opportunities based on profit incentives, while smallholder households offer productive land, labor, entrepreneurship, and other rural resources. Because smallholder households are both producers and consumers of food, their farming choices can affect both income and food security outcomes. In addition, income diversification in the household economy can mean that smallholders allocate their resources across alternative productive activities, including food crops, cash crops, livestock, off-farm employment, and rural microenterprises. In order to understand smallholders' upgrading behavior, it is important to remember that they allocate their resources across competing investment, production, and consumption alternatives.

This paper investigates inclusive growth, with a focus on smallholder participation in agricultural value chains, smallholder upgrading behavior, and economic outcomes related to agricultural productivity and smallholder incomes. The purpose of the paper is to explore how to promote inclusive growth through agricultural value chain development by:

1. Defining inclusive growth in terms of smallholder participation in agricultural value chains and market systems;
2. Identifying factors that affect smallholder participation and upgrading in agricultural value chains, using a model of smallholder behavior change that is a response to real or perceived changes in market opportunities and/or household capabilities; and
3. Examining several recent empirical cases to see how agricultural value chain projects have engaged and benefited smallholders, with a focus on three central questions:
  - **Inclusion:** To what extent have smallholders participated in agricultural value chain projects? What are the different types of project outreach to smallholders?
  - **Upgrading:** Have smallholders been willing and able to add value by upgrading? What kinds of productivity effects have been observed under what conditions?
  - **Benefits:** Are smallholders able to capture some of the additional value that they create through upgrading? Do smallholders and their households receive income benefits from their participation and upgrading investments?

The next section covers background concepts on inclusive agricultural value chain development, USAID's value chain framework, and the microeconomics of smallholder agriculture. These concepts are combined to explain smallholder upgrading decisions as behavior change triggered by shifts in opportunities and capabilities. Section 3 describes the empirical cases included in the review and the evidence on smallholder inclusion. Findings on upgrading behavior, productivity, and household incomes are discussed in Section 4. The paper closes with a summary of key findings and implications for future programming and learning investments.

# 2. Smallholders in Agricultural Value Chains

Smallholders make their decisions to participate in new markets and invest in upgrading from their position at the interface of several systems, including agricultural value chains and farm household economies.<sup>1</sup> This section reviews background concepts from both the value chain framework and the literature on smallholder household economics. Readers already familiar with these concepts may choose to proceed directly to Section 2.3, in which smallholder decisions are modeled as behavior changes made in response to triggers that come from real or perceived changes in market opportunities and/or household capabilities.

## 2.1 Value Chain Approach and Framework

In recent years, USAID and other international development organizations have adapted concepts from the global value chain literature (Gereffi and Lee 2012) to create a systemic approach for achieving inclusive economic growth (USAID 2012). Under leadership from USAID's Microenterprise Development team, the Accelerated Microenterprise Advancement Project-Business Development Services (AMAP BDS Project) (1994-2012) developed the inclusive value chain approach—an approach to private sector development designed to achieve the dual objectives of economic growth and poverty reduction.<sup>2</sup>

The value chain approach is part of a more general trend within USAID's economic programming toward facilitating inclusive market systems. The term “inclusive,” as applied to value chains, highlights the emphasis placed on benefits for microenterprises, smallholders, and the low-income individuals and households who operate them.<sup>3</sup> More generally, an inclusive market system is one that benefits large numbers of low-income households.

A value chain includes the full range of activities and services required to bring a product or service from its conception to sale in its final market. The conceptual framework for analyzing value chains includes both structural and dynamic features of the system. The structural elements, depicted in the general value chain map (Figure 1), include all the firms and other actors involved in the value chain, the vertical and horizontal linkages between these actors, supporting markets, and the business enabling environments within which actors make their decisions. The dynamic elements in the value chain framework include the characteristics of the relationships between firms and the ability of the value chain to remain competitive by

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<sup>1</sup> In addition, smallholders' decisions are influenced by their perspectives on other relevant systems, such as social, political, and ecological systems.

<sup>2</sup> Detailed information about the value chain approach can be found in the Value Chain Development wiki on KDID's Microlinks webpage (<http://microlinks.kdid.org/good-practice-center/value-chain-wiki>). The wiki provides an extensive list of key resources developed under AMAP BDS and by other donors, academics and practitioners. Brief descriptions and links to each resource are included (<http://microlinks.kdid.org/good-practice-center/value-chain-wiki/value-chain-resources>).

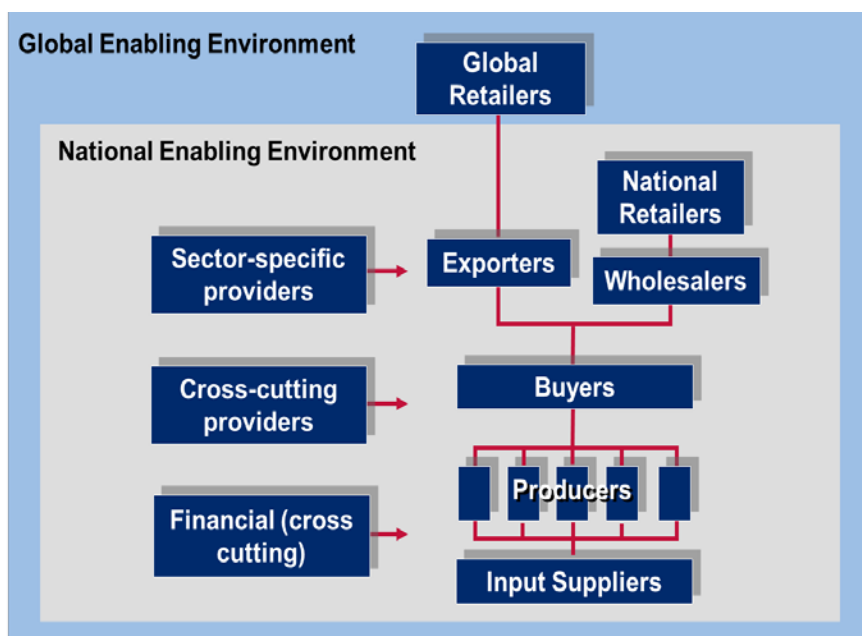
<sup>3</sup> Note, however, that the term “inclusive” is also used in the global value chain literature to describe a value chain that includes one or more firms of any size from within the boundaries of a specific country.

upgrading in response to changing end market demands and requirements. This section describes these structural and dynamic elements in more detail.

The structure of a value chain includes all the participating firms and other agents, and it can be characterized in terms of the following five structural elements:

- **End markets** are always the starting point for value chain analysis because the demand in the end market defines the opportunities that drive the value chain. As can be seen in the value chain map, it is possible for a value chain to have more than one market channel, such as one channel that serves domestic consumers and a second channel that serves consumers in export markets.
- **Vertical linkages** connect firms at different levels of the value chain, from input suppliers to producers, processors, wholesalers, distributors, exporters, and so on, all the way to the retail level. Vertical linkages are the commercial relationships involved in bringing the product up through the value chain.
- **Horizontal linkages** connect firms at the same level of the value chain. Some examples of horizontal linkages would be producer groups and exporter associations. Important functions of horizontal linkages at the producer level include product aggregation to reduce transaction costs, more cost-effective access to inputs and services, access to information, and the empowerment of small firms and farmers to advocate for change.
- **Supporting markets** include firms and organizations that provide business support services to the firms in the value chain. Many are cross-cutting services, such as financial, transportation, and communication services, in that they provide services to firms in more than one value chain. Other supporting markets are sector-specific, such as firms providing technical advice and specialized services.
- The **business enabling environment** consists of all the formal and informal rules that help define the context within which decision makers operate. Examples of significant influences in the enabling environment range from international food safety standards to national trade policy, inflation rates, natural disasters, municipal regulations, and cultural

**Figure 1. General Value Chain Map**



and social norms. Business enabling environments can be defined at a local, regional, national, and/or global level.

The dynamic features in the value chain framework correspond to the emergent properties of the market system. Some of the dynamic features with important implications for project implementation include value chain governance, relationships between firms, and the pace of learning and upgrading:

- **Value chain governance** refers to power and the ability to exert control over the behavior of other agents in the system. Typically, a “lead firm” might set, monitor, and enforce the parameters under which other firms operate. Awareness of the governance structure in the system can be useful in identifying possible interventions and opening pathways for the generation, transfer, and spread of knowledge leading to innovation.
- **Inter-firm relationships** that support healthy competition and value chain competitiveness are mutually beneficial, collaborative, and allow for the free transmission of information and incentives for upgrading. An important function of Inter-firm relationships is to transmit information and incentives, thus improving the responsiveness of firms to changes in end market requirements.
- **Upgrading** at the firm level is defined in terms of investments that increase value added. For example, a produce wholesaler might invest in cooling equipment that improves the shelf life of the product. A farmer might invest in new inputs, training, or irrigation in order to cultivate a new variety of tomatoes that earn a higher price in the market.

In summary, a value chain approach takes a market system perspective with a focus on the pivotal role of end market demand and the identification of leverage points where interventions can catalyze improved value chain competitiveness. Interventions follow a facilitation approach leading to behavior changes among value chain actors, new or more cooperative relationships within the value chain, and/or improvements in the business enabling environment. Interventions seek to encourage firm-level upgrading, value chain competitiveness, and a more broad-based distribution of benefits.

#### Types of Upgrading

**Process:** greater efficiency

**Product:** higher product quality

**Function:** new role in value chain

**Channel:** new market channel

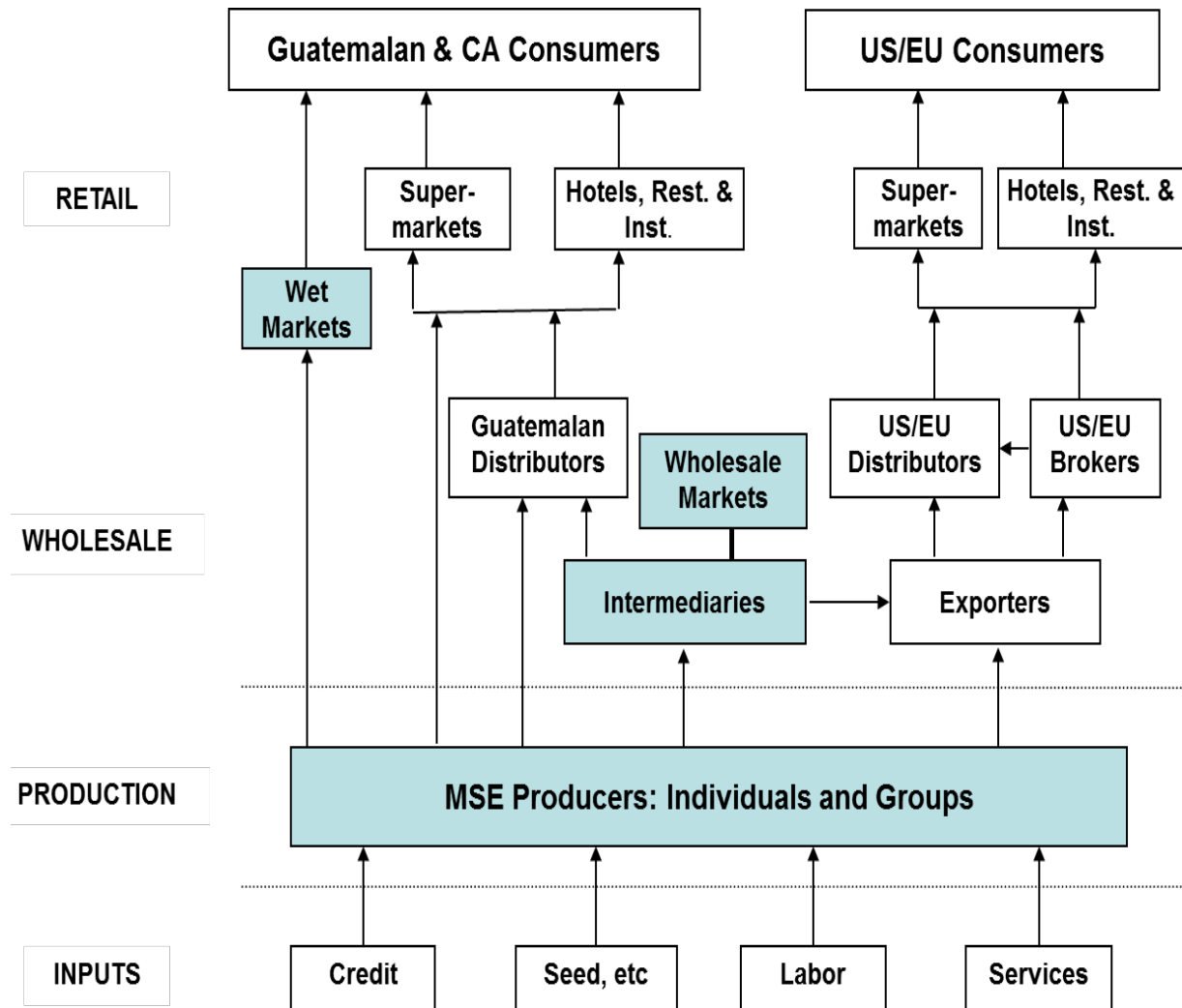
**Chain:** new value chain

#### Example from Guatemalan Horticulture

As an example to illustrate the structural and dynamic features of a value chain, take the case of Guatemalan high-value horticultural products, such as broccoli, snow peas, and baby vegetables. These labor-intensive crops are grown in the mild climate of the western highlands using household and hired labor. There are several processing plants and exporters, with some firms dating back at least to the 1980s.



**Figure 2. Value Chain Map for Guatemalan High-Value Horticulture**



The value chain map in Figure 2 highlights some of the structural features of the market system. The map indicates that there are multiple market channels in this value chain, with end markets reaching consumers inside and outside of Guatemala. The shaded areas in figure 2 represent value chain functions where smallholders and microenterprises predominate: as farmers, intermediaries, and market vendors. An example of horizontal linkages are smallholder producer groups formed to transport produce to market, purchase inputs in bulk, or to gain better access to training and information. The value chain map also shows the vertical linkages between different types of firms, such as the links between distributors and supermarkets in both the domestic and export market channels. In this case, supporting markets are represented across the bottom of the map, at the same level as input suppliers. Along the left side are the functional levels of the value chain, in this case inputs, production, wholesale, and retail.

Smallholder upgrading in the case of Guatemalan horticulture is focused on farmers meeting food safety requirements for fresh produce that enters the U.S. and E.U. This is typical of

other horticulture cases, where food safety and product quality standards in export markets play an important role in shaping value chain governance. Additional governance rules emerge from packers' and processors' needs to schedule reliable supplies of high quality products in order to meet their own delivery contracts. Since buyers are motivated to ensure a steady stream of high quality products, buyers may find it in their best interests to provide embedded services that assist smallholders in adopting advanced production and post-harvest techniques.

## ***2.2 Smallholders and the Household Economy***

Smallholders live in rural areas of developing countries and they are distinguished by the relatively small amounts of agricultural land that they cultivate. The size of farm considered "small" depends on the quality of local agricultural resources and the specific economic context. In general, smallholder farms are defined as operating two hectares or less (World Bank 2003). There are approximately 2.5 billion people living on 500 million smallholder farms in developing countries, with the majority living on less than \$2 per day (IFAD 2013). Based on estimates from Food and Agriculture Organization of the United Nations (FAO) data, the majority of small farms are located in Asia (87 percent), with the next largest number found in Africa (8 percent). There are approximately 33 million smallholder farms in Africa, comprising 80 percent of all African farms (Nagayets 2005).

### Farm Size and Productivity

Despite characteristic land limitations, smallholder farms have long demonstrated a productivity advantage over larger farms, when productivity is measured in terms of output per hectare (Feder 1985). The most widely accepted explanation for the inverse relationship between farm size and productivity is based on smallholders' lower transaction costs in supervising agricultural labor. Smallholder households rely heavily on family labor and management, which has a comparative advantage over hired labor and management in many types of farming systems. This advantage is especially pronounced in cropping systems that require intensive hand labor throughout the production process, such as horticultural crops. When cropping systems are more easily mechanized or routinized, the supervision advantages of family labor are not as strong:

The transaction costs of hired labor in agriculture are typically higher than in the industrial sector due to the spatial dimension of agricultural production, the dependence on biological processes and weather conditions, the role of idiosyncratic knowledge, and the care intensity of agricultural activities. Plantation crops, such as tea and sugarcane, which can be grown in monoculture and with group labor, as well as livestock operations that do not depend on land, such as intensive poultry production, are exceptions to this pattern. (Birner and Resnick 2010)

Smallholders' comparative advantage in labor-intensive cropping systems provides a foundation for understanding their potential strengths as producers in competitive value chains. At the same time, resource limitations in the overall farm household economy serve to limit smallholder participation in value chains.

## Farm Household Economy

Over time, researchers have come to recognize that one of the defining features of the smallholder household is the interconnectedness of the household's production, consumption, and investment activities within a single decision making framework (Singh, Squire and Strauss 1986). Smallholders are both producers and consumers of agricultural goods, and like other microentrepreneurial households, they make their production and investment decisions within the context of their overall household economic portfolio (Chen and Dunn 1996).<sup>4</sup>

Thus, smallholders' decisions to upgrade and participate in specific markets are embedded within the larger process of allocating the household's scarce resources among alternative production, consumption, and investment activities. This decision process can be modeled as a constrained optimization problem over multiple objectives, including income generation, risk management, food security, current consumption, and long-term investment goals related to education, housing, health, and major life events.

## Smallholder Resource Constraints

Smallholders are not a homogenous group; they differ in their resources and capabilities. The household economic portfolio provides a link between smallholders' resource levels and their abilities to respond to new market opportunities. Those with critical resource limitations may not meet minimum requirements for participation. Resource limitations, such as land fragmentation, household labor shortages, and food insecurity, all can serve to limit the ability of smallholders to establish linkages with more lucrative markets.

**Land fragmentation.** Some households in the smallholder category have such small land holdings that they are no longer viable farming units. A review of national surveys from five countries in Sub-Saharan Africa showed significant differences in farm sizes among smallholders (Jayne et al. 2010). Those households with the largest landholdings also had the highest income per capita and highest crop revenues. Those with the smallest landholdings earned the lowest crop revenues and relied more heavily on off-farm income sources. At least 25 percent of households were approaching effective landlessness, holding less than 0.11 hectares of land per capita.

**Labor shortages.** When households face chronic and/or cyclical labor shortages, it reduces their ability to respond to new opportunities. Many smallholders experience cyclical labor shortages, such as during planting and harvest seasons. For some smallholders, hired labor increases enterprise net returns, while contributing to rural employment. For other households, chronic shortages of household labor reduce the scope of the farm enterprise. Women headed

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<sup>4</sup> The household economic portfolio consists of three components: 1) the set of resources available to the household, including human, physical, financial, informational, and social resources; 2) the set of economic activities undertaken by members of the household, including production, consumption, and investment activities; and 3) the decisions that allocate resources to activities. Resource allocation decisions are followed by subsequent outcomes representing the returns from the selected activities back to the pool of resources. The resource allocation decisions and resulting outcomes create a circular flow between resources and activities in each period.

smallholder households are often at a disadvantage due to low levels of household labor resources.

**Food insecurity.** Food insecure households are generally less willing to undertake risky investments, including the kinds of investments needed for upgrading. For food insecure households, the need to bolster food security can take precedence over farm enterprise investments. An important example is when food security concerns result in a household planting food crops when higher revenues could be earned producing higher value crops for sale in the market.

**Financial constraints.** Even when households are food secure, they still may be unable to invest in agricultural upgrading due to shortages of working capital and lack of liquidity for longer term upgrading investments. New crops may require higher cash outlays at planting time; new techniques may require investments in physical assets, such as irrigation pumps or greenhouses. For those households that are unable to self-finance these investments, the ability to upgrade depends on available opportunities in surrounding financial markets.

In summary, those households with severe resource constraints are less likely to find a pathway out of poverty as smallholder farmers in inclusive value chains (Fowler and Brand 2011; Garloch 2012). Instead, their best opportunities may be to seek off-farm employment. Smallholders need some minimum levels of resource combinations before they are capable of making the investments and undertaking the new behaviors required for upgrading and participating in competitive value chains.

### **2.3 Upgrading as Behavior Change**

Smallholders make their upgrading decisions based on their assessment of the risk-adjusted returns to upgrading, within the context of their alternative opportunities, their resources and capabilities, and their access to information and learning opportunities (Dunn et al. 2006). In order to analyze smallholders' decisions to enter new markets and undertake upgrading investments, it is useful to distinguish between factors that are internal to the household economy and factors that are external to the household, but part of the market system. These two general categories of factors influencing smallholder behavior change are distinguished as opportunities and capabilities:<sup>5</sup>

- **Opportunities refer to the perceived characteristics of economic alternatives.** Opportunities provide the external (“pull”) incentives that motivate smallholders to enter new markets and invest in upgrading. To a large extent, these incentives are based on smallholders' perceptions of the profit and risk profile for the new opportunity and the comparison of this profile to the next best available opportunity. Opportunities originate in end market demand, but to the extent that end markets are distant, then smallholders gain access to these opportunities by working with other actors in the

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<sup>5</sup> The categories correspond to Boquiren's (2012) three aspects of firm-level behavior change: 1) *ability* refers to firms' access to the resources and skills needed to perform the behavior, 2) *incentives* provide the motivations for firms to “enroll in the change process,” and 3) *triggers* are the catalytic conditions and events leading to action. According to Boquiren, the role of project implementers is to create, identify, and reinforce the triggers leading to behavior change.

value chain. In this way, incentives are filtered through the value chain and the business enabling environment. It is equivalent to the smallholder considering an opportunity and asking him or herself: “Is it worth it? Is it better than my next best alternative?”

- **Capabilities refer to the capacity of the household to respond to opportunities.** Capabilities are rooted in the characteristics of the household economic portfolio and correspond to the knowledge, skills, and resources that are available to the household. These include access to physical resources, such as land, irrigation, tools, and machinery; financial resources, including working capital, savings, and credit; and human resources, including not only the size of the household labor force, but also health and embodied human capital, such as literacy, numeracy, and business and sector-specific knowledge and skills. Capability includes knowledge, resources, skills, and agency. It is equivalent to the smallholder considering an opportunity and asking him or herself: “Am I able to enter this market and/or upgrade? Do I have the capabilities I need to succeed?”

Triggers are changes in opportunities or capabilities (or both) that provide the incentives for firms to act. Changes in smallholders’ awareness, understanding, and/or perception of opportunities can also trigger behavior change. Examples of triggers that change opportunities include changes in prices, changes in the rules of the enabling environment, access to more efficient technologies and business models, new information, and better risk management mechanisms. In other words, a trigger is a real or perceived change in capabilities and/or opportunities, creating in the smallholder a greater willingness (change in opportunities) or ability (change in capabilities) to adopt new behaviors.

# 3. Evidence on Smallholder Inclusion

This paper is based on information from twelve cases in ten countries, all representing agricultural value chains with smallholder farmers participating at the producer level. The evidence comes from a variety of sources, including seven independent impact evaluations based on experimental or quasi-experimental designs. This section describes the cases and presents findings on smallholder inclusion. The results indicate generally high smallholder participation, despite overlooked categories of project outreach to smallholders.

## 3.1 Cases Reviewed

The information for this study comes from evaluations conducted over the past decade, all with a focus on smallholders in agricultural value chains (Table I). The cases come from Africa, Latin America, South Asia, and Central Europe. Most involve donor interventions to promote inclusive value chain development, including projects funded by USAID, Millennium Challenge Corporation (MCC), U.K. Department for International Development (DFID), and the Gates Foundation. The evidence is drawn from monitoring data, independent impact evaluations, cross-sectional research, and cross-country studies. Table I provides general information about the cases, including the type of study reviewed for each case.

Horticulture and dairy are the most commonly represented value chains in this review. In fact, the cases in two countries—Kenya and El Salvador—include value chain development projects in both horticulture and dairy. The projects in Nigeria and Zambia focused on developing agricultural input markets using new types of supply agents (including many microenterprises) and new delivery mechanisms better matched to smallholder capacity and scale. Other projects, such as in Armenia and Ghana, intervened to improve productivity and business skills for smallholders producing a large range of more traditional crops, including staple grains and vegetables for the domestic market.

The two cases in Table I that are not associated with donor projects are the horticulture value chains in Guatemala and Tanzania. Information for these two cases comes from cross-sectional research studies on smallholder upgrading and market linkages. The Guatemalan and Tanzanian cases provide an interesting contrast because, while they are both horticultural value chains aimed at export markets, the Guatemalan value chain was established more than 25 years ago and has a history of including large numbers of smallholders and other microenterprises (for more about the horticulture value chain in Guatemala, see Section 2.1). On the other hand, development of the horticulture value chain in Tanzania was at an early stage at the time of the field study, with few exporters, low export volumes and few smallholders selling products into the export market.

**Table 1. Cases Included in Review**

<b>Country and Value Chain</b>	<b>Type of Study</b>	<b>Project Name</b>	<b>Project Information</b>
<b>Armenia Higher Value Crops</b>	Experimental Longitudinal Impact Evaluation	Water-to-Market and High Value Agriculture, components of Irrigated Agriculture Project	\$14 million over 5 years (2006-2011) MCC funded
<b>Bangladesh Dairy</b>	Quasi-experimental Longitudinal Impact Evaluation	Strengthening the Dairy Value Chain (SDVC)	\$4.8 million over 5 years (2007-2012) Gates funded
<b>Ghana Traditional Crops</b>	Experimental Longitudinal Impact Evaluation	Commercial Training Activity, component of Agriculture Project	\$62.5 million over 5 years (2006-2011) MCC funded
<b>Guatemala Horticulture</b>	Cross-sectional Research Study	No project	Research under USAID AMAP BDS Project (2004-2008)
<b>India Vegetables</b>	Quasi-experimental Longitudinal Impact Evaluation	Growth Oriented Microenterprise Development (GMED)	\$6 million* over 4 years (2004-2008) USAID funded
<b>Kenya Dairy</b>	Longitudinal Cross- Country Study	Kenya Dairy Development Project (KDDP)	\$8.3 million over 6 years (2002-2008) USAID funded
<b>Kenya Horticulture</b>	Quasi-experimental Longitudinal Impact Evaluation	Kenya Horticulture Development Program (KHDP) and Kenya Business Development Services (KBDS)	\$10.2 million over 6 years (2003-2009) USAID funded and \$5 million over 5 years (2002-2007) USAID funded
<b>Kenya Maize</b>	Longitudinal Cross- Country Study	Kenya Maize Development Program (KMDP)	\$11.2 million over 8 years (2002-2010) USAID funded
<b>Nigeria Fertilizer</b>	Evaluation following DCED Standards	Promoting Pro-Poor Opportunities in Commodity and Service Markets (ProOpCom)	£9.9 million* over 3 years (2008-2011) DFID funded
<b>El Salvador Dairy and Horticulture</b>	Experimental Longitudinal Impact Evaluation	Production and Business Services Activity (PBS), component of Productive Development Project	\$55 million* over 5 years (2006-2012) MCC funded
<b>Tanzania Horticulture</b>	Cross-sectional Research Study	No project	Research under USAID AMAP BDS Project (2004-2008)
<b>Zambia Agricultural Inputs</b>	Quasi-experimental Longitudinal Impact Evaluation	Production, Finance and Improved Technologies (PROFIT)	\$17 million* over 6 years (2005-2011) USAID funded

\*These project budgets include additional value chain interventions not listed here.



### 3.2 Smallholder Participation and Project Outreach

All of the projects report on the number of smallholders that were reached through project interventions. Much of this information comes from project monitoring data, but some of it is based on rough estimates of spillover effects and reports provided from third party actors in the value chain. The data often are not comparable across cases due to inconsistencies in the ways that outreach is measured. Obtaining an accurate count on the number of smallholders benefiting from a project can be complicated by the indirect nature of outreach in value chain development and the reliance on spillover effects (a.k.a. crowding in, ripple effects, diffusion) as a major strategy for reaching large numbers of smallholders and achieving sufficient scale.

Three distinct categories of project outreach can be identified, as shown in Figure 3. Direct contact entrepreneurs are those who interact with project-funded personnel, activities, or materials, such as by participating in a training course conducted with project funding or by receiving improved inputs as part of the project facilitation activities. An indirect contact entrepreneur is vertically linked to a direct contact entrepreneur. Project interventions reach smallholders indirectly through their commercial relationships in the value chain and its supporting markets. There are several examples of smallholders who are reached as indirect contacts through their vertical linkages to input suppliers and lead firms that buy their products, such as exporters or supermarkets. The imitator entrepreneurs are reached through project demonstration effects of successful new practices and business models. These spillover effects may turn out to be the largest part of project outreach, although the cumulative effects can be expected to start relatively small and build over time. Still, there are no standards for estimating and reporting the number of smallholders reached through spillover effects.

**Figure 3. Project Outreach Categories**



Source: Creevey, Dunn and Farmer 2011.

The findings on project outreach are indicated in Table 2, along with estimates of the number of smallholders participating in the two horticulture value chains not associated with projects. As noted above, the numbers in Table 2 are not directly comparable, because there are differences in the outreach categories that were included. However, the evidence indicates that relatively large numbers of smallholders are being reached by many of these value chain projects. Projects reaching smallholders through agricultural input markets report the highest smallholder participation, while projects with a heavy emphasis on conducting training courses for smallholders also report high participation rates in the form of direct contacts. The project in India estimated the number of imitator firms to be more than four times the size of project outreach to direct and indirect contacts.

The information in Table 2 highlights the major difference in scale between the horticulture value chains in Guatemala and Tanzania. While approximately 450,000 smallholders were

participating, producing high-value vegetables for export from Guatemala, there were only 2,000 smallholders producing similar products for export in Tanzania. Note that these are both examples of value chain participation by smallholders, participation that occurs independently of any project outreach. Participation is a broader measure than project outreach, because participation includes all the smallholders in the value chain and not just those who have been reached by project interventions, whether directly, indirectly or as imitators.

**Table 2. Smallholder Participation, by Project Outreach Category**

Country and Value Chain	Number of Smallholders	Outreach Category
Armenia High Value Crops	81,710	Project direct contacts
Bangladesh Dairy	36,400	Project direct contacts
Ghana Traditional Crops	66,930	Project direct contacts
Guatemala Horticulture	450,000	Participants in value chain (no project)
India Vegetables	2,700 12,800	Project direct and indirect contacts Project imitator firms
Kenya Dairy	91,500 144,700	Project indirect contacts (for AI) Project direct and indirect contacts
Kenya Horticulture	58,000 12,900	Project direct contacts (KHDP) Project direct and indirect contacts (KBDS)
Kenya Maize	384,900	Project direct and indirect contacts
Nigeria Fertilizer	569,500	Project indirect contacts
El Salvador Dairy and Horticulture	15,400	Project direct contacts
Tanzania Horticulture	2,000	Participants in value chain (no project)
Zambia Agricultural Inputs	143,000	Project indirect contacts

# 4. Evidence on Smallholder Upgrading and Benefits

Smallholder upgrading is at the core of inclusive value chain development because upgrading adds value by improving efficiency and/or product quality.<sup>6</sup> Upgrading opens the door for smallholder households to employ their resources more productively, and if market conditions are favorable, to earn higher returns from agriculture. There are several cases showing that projects can have positive impacts on upgrading behavior and productivity. There are also examples of positive impacts on enterprise income, but the evidence for impacts on household incomes is weak. The weak results on smallholder income may be at least partially due to problems in evaluation methods. This section closes by outlining some of the common factors that incentivize smallholder behavior change toward participating in new markets and investing in upgrading.

**Process upgrading** increases technical efficiency and/or reduces production costs. Examples of process upgrading in smallholder agriculture include:

- Converting to drip irrigation;
- Improved plant spacing;
- Improved seeds and inputs; and
- Soil conservation techniques.

## 4.1 Upgrading and Productivity

Upgrading can be measured in terms of improvements in physical productivity, efficiency and product quality. An alternative approach to measuring upgrading is to observe if farmers have adopted and continue to use upgraded practices. By looking more closely at smallholders' upgrading decisions, it is possible to identify conditions under which smallholders respond to upgrading opportunities. As shown in Table 3, there is strong evidence to indicate that smallholders are willing and able to increase their productivity through upgrading.

**Product upgrading** improves product quality in ways that increase its value to the consumer. Examples of product upgrading in smallholder agriculture include:

- Cultivating new crop varieties with features, such as color, size, or shape, that consumers prefer; and
- Complying with food safety standards related to pesticide and bacterial contamination.

Value chain participation and upgrading are closely related behavior changes. In fact, some type of process and/or product upgrading is often required before smallholders can participate in higher value markets and market channels. For example, a farmer must be able to meet stringent food quality standards in order to sell into certain export market channels. Many of the same incentives that influence smallholders to participate in value chains are also at work to influence smallholders to invest in upgrading.

<sup>6</sup> This paper focuses on process and product upgrading and most of the cases report only on these two types. Functional upgrading involves a much smaller part of the smallholder population, although microenterprises may play a useful role in value chains at levels above and below the production level. Channel and chain upgrading are an implicit part of the discussion, since participation itself is the result of households choosing to allocate their resources into new market channels and value chains.

**Table 3. Results on Smallholder Upgrading, Productivity, and Income**

Country and Value Chain	Upgrading Behavior	Agricultural Productivity	Enterprise Income	Household Income
<b>Armenia High Value Crops</b>	Target number of farmers were trained and used improved irrigation or cropping techniques (PM), but no evidence that training impacts use of improved practices (PI).	No impacts detected on crop yields (PI).	No impacts detected on crop revenues (PI).	No impacts detected for household incomes (PI).
<b>Ghana Traditional Crops</b>	Targets exceeded for number of farmer-based organizations and individual farmers trained in new farming methods (PM), but evidence on impacts of training on use of improved practices was weak (PI).	No impacts detected on average crop yields across entire sample, but results differed across the three zones (PI).	No impacts detected on average crop income, but with zonal differences: northern farmers had higher crop incomes, but southern farmers had lower crop incomes, both relative to control group in zone (PI).	Not reported.
<b>India Vegetables</b>	Evidence of positive impacts on farmer awareness of improved practices, but no evidence of impacts on use of improved practices (PI).	No evidence of impacts on crop yields; vegetable production fell sharply for all groups between 2007 and 2009, coinciding with market contraction (PI).	No impacts detected on average crop incomes, which fell for all groups in pattern reflecting zonal differences in market opportunities (PI).	Not reported.
<b>Kenya Dairy</b>	New genetic material adopted by 91,500 smallholder dairy farmers through artificial insemination services (PM).	Milk yields increased 19% per cow, unit costs fell 16% and value of nationally traded dairy products increased 37% (PM).	Not reported.	In cross-country study using longitudinal data (2004, 2006, 2008), poverty rates fell 4.9% more for direct treatment households and 9.9% more for indirect treatment households, when compared to control households (PI).
<b>Kenya Horticulture</b>	Smallholders growing avocado and passion fruit increased use of spraying, grafting, pruning, and other services sold by market linkage firms (PM).	Evidence of positive impacts on productivity, defined as annual production per mature tree or vine (PI).	Significant increase in crop income for participants and imitators relative to those who did not apply new methods (PI).	
<b>Kenya Maize</b>	Training in improved inputs and practices, demonstration plots, and capacity development in farmer associations; at project end, 98% of targeted farmers used improved seeds (PM).	Smallholder maize yields tripled over the baseline period (PM).	Average household income for participants increased by \$533 or \$1.46 per day (PM).	

<b>Nigeria Fertilizer</b>	Fertilizer sold in smaller packets through a rural sales network providing demonstrations, resulting in increased fertilizer use by smallholders (PM).	Productivity increased 15% over baseline period. Yields increased in maize (39%), sorghum (60%), and rice (13%) (PM).	Crop income increased 30-40% for farmers using fertilizer in recommended doses and application methods (PM).	Household net income increased 32% over baseline period (PM).
<b>El Salvador Dairy and Horticulture</b>	Targets exceeded for number of farmers trained, with 75% of farmers applying improved methods (PM).	Significant increase in volume of dairy products sold; no evidence of impact on productivity in horticulture (PI).	Large and significant increase in dairy income for participating farmers; no evidence of impact on horticulture income (PI).	No impacts detected on net annual household income or consumption in dairy or horticulture (PI).
<b>Zambia Agricultural Inputs and Services</b>	Agrochemical/seed suppliers (14) worked through network of 600 sales agents to increase sales and use of improved inputs by smallholders (PM).	Maize production increased 82% for active farmers and 68% for non-active farmers, but difference not significant (PI).	Active participants increased crop income significantly more than non-active farmers (173% and 47%, respectively) (PI).	Cash consumption expenditures increased for both groups, but difference was not significant (PI).

**Note:** Information followed by (PM) is taken from project monitoring results, while information followed by (PI) is taken from impact evaluation results.

To interpret the upgrading and productivity results in Table 3, it is helpful to consider the type of project intervention, the context within which the intervention was implemented and the type of evaluation approach. Starting with the type of evaluation approach, note that upgrading and productivity findings are generally more positive when results are obtained from project monitoring (PM) data than when results are obtained from impact evaluation (PI) data. One obvious explanation for this difference is that project monitoring represents observations of participation and practice among project participants over time. In an impact evaluation, there is a higher burden of proof in that any positive changes observed for project participants must be compared to (reduced by) positive changes observed among a valid counterfactual population.

The broader context within which an intervention takes place can have a determinative effect on upgrading results. Sudden changes in macroeconomic, regulatory, market or weather conditions can exert an influence on smallholder upgrading behavior that far exceeds the influence of project interventions. The India case provides several examples of the dampening effect of external shocks on project outcomes. This project worked to facilitate the expansion of commercial linkages between Indian supermarkets and smallholder vegetable farmers. An example of a shock originating in the business enabling environment occurred when officials in one region reversed their interpretation of marketing regulations and placed a fine on sales of produce procured directly from farmers. Since the fine would result in negative profits for the supermarket chain, it subsequently ended procurement from farmers in that state.

In addition, the global recession of 2008 was a macroeconomic shock that resulted in an abrupt hold on supermarket expansion plans and the closing of retail outlets in some areas. By the time second-round survey data were collected in 2009, significant commercial linkages between supermarkets and smallholders had been sustained in only one of the four survey regions. While project participants in all four regions had become aware of upgraded farming methods, the only farmers still willing to invest in those upgraded techniques were located in the one region where supermarket buyers continued to purchase vegetables from farmers.

The combined participation (Table 2) and upgrading (Table 3) results suggest that project interventions focused on facilitating inclusive changes in markets for agricultural inputs and services have greater outreach and report consistently positive upgrading results. All of the projects reporting project outreach in excess of 100,000 smallholders placed a heavy emphasis on improving agricultural inputs and input markets. In some cases, there is an essential linkage between purchase and use of an improved input. A good example of linked purchase and use outcomes from the Kenya dairy case in which more than 90,000 smallholder dairy farmers purchased artificial insemination services to improve milk productivity.

Some of the best outreach and upgrading results were reported by projects that worked with large input suppliers to reach smallholders through networks of rural sales agents. In addition, these networked sales agents offered inputs and services that were appropriately scaled to match smallholders' small cropping areas and/or small herds. The lower cash outlays for inputs and services sold in smaller units were also a better match for smallholders' limited cash flow. Having communities self-select their rural sales agent improved trust and contributed to rapid expansion. The two best examples of these types of input-focused interventions are the cases from Nigeria and Zambia.

## 4.2 Value Capture, Farm Income, and Household Income

Assuming that smallholders participate in higher value markets and improve their products and processes by upgrading, then the third outcome of concern is whether smallholders are able to capture some of the additional value they create. The value captured by a smallholder is equivalent to enterprise profits, or sales revenue less the costs of production (net revenue). Keeping in mind that smallholder households typically have a number of income generating activities, including a number of different crops, then an increase in profits from one enterprise only translates into an equivalent increase in household income so long as it does not reduce profits from another enterprise. So, while value capture is defined in terms of enterprise profits, there is a potential gap between enterprise profits and the guiding development objective, which is measured in terms of household incomes and poverty levels.

The evidence on value capture is incomplete at best. Some of the problem is due to the relative difficulty of eliciting accurate recall data for composite variables (profits, income, poverty rates) within the context of a survey interview, but another important reason for the lack of evidence is that some of the inherent characteristics of the value chain approach—such as indirect facilitation, project evolution, and reliance on spillover effects—present significant barriers to traditional impact evaluation methods (Creevey et al. 2010). In a review of 30 inclusive value chain projects, Humphrey and Navas-Alemán (2010) found that most monitored project activities and outputs, but only six of the 30 projects had made a systematic attempt to quantify poverty reduction, the intended benefit of the projects. All but one of the six lacked either a baseline or a valid control group, and the best of the six studies had inconclusive statistical results. The authors concluded that their review delivered little credible evidence of impacts on poverty reduction. A recent summary of lessons learned from experimental studies cited significant challenges to impact evaluations of inclusive agriculture projects (Farley et al. 2013).

The evidence on smallholder value capture is summarized in Table 3. While some of the cases did not contain information on value capture, those that do paint a mixed picture. From India and Zambia, which are studies based on similar research designs, the results were either inconclusive or show no statistically significant impacts. The Nigeria study found increases in household net income, measured in terms of agricultural profits, based on estimates from the project's monitoring and evaluation data.

In an analysis that included participants in several Kenyan projects, the evidence on value capture was measured in terms of household income and poverty reduction, using the \$1.25 poverty line (Oehmke et al. 2010). The evaluation included smallholders participating in the KMDP, KHDP, and KDDP projects. The findings indicate that poverty rates for direct participants in these three projects fell significantly faster than did poverty rates for smallholders in control villages (around five percent more). Project participants also experienced large increases in productivity due to various types of upgrading. It is interesting to note that the drop in poverty rates was largest (around ten percent) for non-participants in treatment villages. This finding suggests strong spillover effects in local areas. Similarly, the evaluation in Nigeria found evidence for widespread spillover in treatment areas, as did the baseline data from the evaluation of the smallholder dairy project in Bangladesh.



There is still not enough evidence to make a general statement about the empirical relationship between agricultural value chain projects and poverty reduction among smallholders. This conclusion is highlighted in a report from MCC, which summarizes findings from its first five impact evaluations of agricultural projects (MCC 2012). Three of these evaluations are included in Table 3. These independent, randomized impact evaluations looked specifically at the links between farmer training, enterprise income and household income.

While three of the five MCC evaluations of smallholder training programs reported strong evidence for increases in enterprise income, none of the evaluations found evidence for impacts on household incomes. Rather than conclude that there are no impacts on household income and poverty rates, the authors suggest a number of possible alternative explanations, including the likely explanation that not enough time has passed for these final impacts to occur. In addition, they conclude that evaluators need to place greater emphasis on understanding the program logic and the timing and relationships between the various components of a value chain development project, such as training, policy reform, infrastructure improvements, and interventions to strengthen vertical and horizontal linkages.

#### **4.3 Factors Influencing Behavior Change**

The context and implementation details from the cases in the study provide information about the factors that influence smallholder behavior change. In Table 4, the factors that can “nudge” smallholders toward higher levels of participation, productivity, and benefits are organized into two categories: capabilities and opportunities. These two categories are defined in Section 2.3 (above). In brief, *capabilities* refer to characteristics of the smallholder while *opportunities* refer to conditions and incentives that are external to the smallholder. These can also be considered “push” and “pull” factors, respectively.

Some of the fundamental capabilities that smallholders need to participate in higher value markets include sufficient levels of required resources (e.g., land, labor, and financial capital), sufficient levels of food security, and basic awareness of the opportunity. For value creation in the form of increased productivity, smallholders usually must have sufficient technical skills and access to the essential inputs and other productive resources needed for upgrading.

Some of the fundamental *opportunities* listed in Table 4 may seem rather obvious. For example, for smallholders to participate in higher value markets, there must be a market linkage (buyer) connecting smallholders into these markets. If smallholders lack access to buyers linked to higher value markets due to geographic, political, or cultural barriers, then participation in those markets does not happen. Similarly, it may seem obvious that the market must offer a price incentive to justify smallholder investment in upgrading, but the importance of the price signal in eliciting behavior change can be overlooked. The business enabling environment plays a critical role at every stage. By opening access to markets, lowering costs, and improving information, changes in the business enabling environment can create strong incentives for behavior change.

**Table 4. Factors Influencing Smallholder Behavior Change**

	<b>INCLUSION/ PARTICIPATION</b>	<b>UPGRADING/ PRODUCTIVITY</b>	<b>BENEFITS/ INCOME</b>
<b>CAPABILITIES “PUSH” FACTORS</b>	<ul style="list-style-type: none"> <li>• Minimum HH resources, including land and household labor</li> <li>• Food security—land is available beyond what is needed for food crops</li> <li>• Certification, such as in good agricultural practices or organic certification</li> <li>• SHs are aware that opportunity exists</li> </ul>	<ul style="list-style-type: none"> <li>• Technical knowledge and skills</li> <li>• Access to finance for short- and long-term investments, from savings, credit, income (wages, microenterprises, remittances)</li> <li>• Missing inputs and services provided by supporting markets, as embedded services from buyers, suppliers, or through horizontal linkages</li> </ul>	<ul style="list-style-type: none"> <li>• SHs have information on prices paid for product at each level</li> <li>• SHs understand nature of end market demand and quality requirements</li> <li>• SHs able to meet quality and safety standards</li> <li>• SHs horizontally linked to improve market power</li> </ul>
<b>OPPORTUNITIES “PULL” FACTORS</b>	<ul style="list-style-type: none"> <li>• Buyers enter local area who sell into high-value markets</li> <li>• Quality inputs and supporting services are available at low unit costs</li> <li>• Change in BEE opens new markets, e.g., trade policy, local market reforms, price restrictions</li> </ul>	<ul style="list-style-type: none"> <li>• Buyers pay price premium for upgraded product</li> <li>• SHs and their commercial partners build trust through repeated transactions</li> <li>• BEE improves to lower costs, e.g., infrastructure (utilities, roads, transport, cold chain storage, ICT)</li> </ul>	<ul style="list-style-type: none"> <li>• Few producers able to meet buyer specifications relative to demand from buyers</li> <li>• Buyers know producers have market alternatives, so they offer better terms</li> <li>• BEE promotes standards, transparency, market information, horizontal linkages, good governance</li> </ul>

Abbreviations: household (HH); smallholder (SH); business enabling environment (BEE); and information and communication technology (ICT).

# 5. Implications and Conclusion

In summary, this review of evidence offers several findings relative to smallholder inclusion, upgrading, and benefits. It seems clear that relatively large numbers of smallholders can be reached through market systems facilitation projects. In addition, smallholders display a willingness to upgrade in order to increase agricultural productivity. As might be expected, willingness to upgrade is predicated on smallholders' perceptions of their market opportunities and household capabilities. The review found some relatively good evidence that smallholders are able to earn higher profits from their upgraded farm enterprises. However, results from several impact evaluations indicate that positive impacts on enterprise income do not necessarily imply positive impacts on household income. This section discusses some of the implications of these findings on programming and evaluation practice.

## *5.1 Implications for Inclusive Market Programming*

Greater inclusion implies a lowering of the “opportunities” bar and a raising of the “capabilities” bar, so that: 1) there are profitable options available to smallholders; 2) smallholders are aware of and have the information they need to evaluate new options and determine if they are a good fit with the household's existing portfolio of economic activities; and 3) smallholders have access to the resources and capabilities that are required for participation and upgrading. The findings from this review of cases suggest several types of investments that donors can make to facilitate inclusive agricultural market systems.

Facilitate increases in the quality and types of information available to smallholders. Making general market and price information readily available to smallholders is a relatively low-cost way to expand the number of smallholders who can perceive and correctly evaluate alternative market opportunities. It is important to keep in mind that the smallholder's perception of expected returns is what makes the difference, not the perceptions of agronomists or extension agents. The most effective information delivery mechanisms will match the educational, experiential, and resource levels of the target audience. Higher value markets for agricultural products usually require specialized technical knowledge in production and post-harvest techniques. Experience indicates that smallholders are willing to respond to end market specifications, with the most common channel for this information being through vertical linkages to buyers and/or input suppliers. Lack of trust can be a significant obstacle to effective information sharing in these value chain relationships. In order to build inclusive market systems, it is important to address information bottlenecks and facilitate the unobstructed flow of market and technical information to smallholders.

Develop and facilitate scale-appropriate agricultural technologies and input packages. National and international agricultural research efforts should focus on increasing the productivity of smallholders, including technologies to increase productivity per unit of land. In order to encourage widespread adoption, these new practices must be well-matched to smallholders' resource and risk profiles. While the cases in this study highlight the success of new types of sales networks for inputs and services, this is not the only effective way to bring improved

practices to smallholders. Improved inputs can be delivered through a variety of channels, including as embedded services from buyers, through producer associations, and through supporting markets. It is important to keep in mind that agricultural intensification is not a universal solution. In parts of Africa with high population densities and extremely small farm sizes, some smallholders are essentially landless (Jayne et al. 2003). It will be much harder for these households to take advantage of new agricultural technologies on their own farms.

Make investments that benefit large numbers of smallholders, such as improvements in infrastructure, communications, and the regulatory environment. Improved roads, power, transportation, and cold chain storage systems can help to reduce costs and improve profitability for smallholders and their commercial partners. Advances in information and communication technology can also lower costs, especially the costs of obtaining market and technical information. Business, financial, and technical training help to expand smallholder capabilities, as do fundamental improvements in health, education, and literacy. When planning investments to benefit broad populations in rural areas, special attention should be paid to incorporating deliberate strategies to include women and girls.

## **5.2 Information Gaps**

The review exposes a number of weaknesses in current approaches to monitoring results and evaluating the impacts of inclusive agriculture projects. Inconsistent application of evaluation concepts and methods makes it difficult to compare results across projects. Specifically, the review highlights the need for improved measures of smallholder participation and household income. Until these methodological issues are addressed, there will continue to be serious gaps in our knowledge about the scale of outreach from market systems development projects and the level of benefits that participating smallholders receive.

Improve and standardize indicators for smallholder outreach under market facilitation projects. There are no generally accepted methods for identifying and measuring the three types of project participants under a market systems facilitation approach. These three types are identified in Figure 3 as direct contact entrepreneurs, indirect contact entrepreneurs, and imitator entrepreneurs/firms. Lack of comparability in participation numbers across projects, as illustrated in Table 1, will continue to be a problem until more consistent methods are followed. Implementing organizations sometimes struggle with measuring indirectly participating smallholders, to a large extent because assistance is needed from the project's commercial partners to collect and report these data. When it comes to imitator firms, which are associated with spillover or crowding in effects, there is very little reliable information. While it is conceptually possible that the number of smallholders reached through spillover effects is several times larger than the combined number of smallholders reached directly and indirectly, this hypothesis has not been empirically tested.

Improve approaches for measuring impacts on income under inclusive market systems projects. A major problem to date has been that schedules for impact evaluations are too short to capture income effects. Most evaluations reported here allowed only two or three years between baseline and endline. Longer time horizons, possibly including post-project

observations, are needed in order to understand how participant income changes over time and to reach more definitive conclusions about impacts on income.

A second problem is that approaches for measuring enterprise and household income do not reflect the unique status of smallholder households as both producers and consumers of agricultural products, which requires incorporating consideration of issues such as household food security, household income diversification, intra-household resource allocations, and the fungibility of capital. This more nuanced approach could help to explain the puzzling gap between positive impacts on enterprise income (crop, livestock, and farm profits) and lack of impacts on household income, which is the third issue that needs to be addressed.

Fourth, impact evaluators need to understand the logic underlying market system facilitation, so that evaluation designs fit implementation plans and reflect the synergistic influence of interventions at multiple levels of the market system. Finally, attention should be paid to measuring the full impacts of these projects by incorporating benefits that accrue beyond the smallholder household, such as impacts on rural food and labor markets, as well as multiplier effects resulting from the circulation of increased expenditures in the local economy for consumption and for agricultural investment.

### **5.3 Conclusion**

With inclusive market development, the goal is to promote economic growth with poverty reduction by facilitating the integration of large numbers of micro- and small enterprises into competitive value chains. The recent development experiences reviewed in this paper indicate that smallholders can play a significant role in competitive value chains, so long as they have the requisite capabilities, profitable opportunities, and the information they need to accurately assess their alternatives. In addition, there are significant steps that governments, development practitioners, and for-profit firms can take to promote inclusion, by building smallholder capabilities, facilitating improved market opportunities, and improving the quality of information that smallholders use when they make their decisions. It is important to keep in mind that decisions about market participation and upgrading are made by smallholders themselves, based on their understanding of their own best interests.

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