



Feed the Future Learning Agenda Literature Review: Expanded Markets, Value Chains, and Increased Investment

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LIST OF ACRONYMS

AGRA	Alliance for a Green Revolution in Africa
AACF	African Agricultural Capital Fund
ANDE	Aspen Network of Development Entrepreneurs
BFS	Bureau for Food Security
CGAP	Consultative Group to Assist the Poor
COMESA	Common Market for Eastern and Southern Africa
EAC	East Africa Community
FAO	Food and Agriculture Organization
FDI	Foreign direct investment
FEWS Net	Famine Early Warning Systems Network
GDP	Gross domestic product
I4	Index Insurance Innovation Initiative
ICBT	Informal cross-border trade
ICT	Information and communication technology
IFPRI	International Food Policy Research Institute
M&E	Monitoring and evaluation
MCC	Millennium Challenge Corporation
MFI	Microfinance institution
MT	Metric ton
NGO	Non-governmental organization
R&D	Research and development
RATIN	Regional Agricultural Trade Intelligence Network
SADC	Southern Africa Development Community
TNC	Transnational corporation
USAID	United States Agency for International Development

MAIN FINDINGS AND CONCLUSIONS

To ensure that impact evaluations being undertaken for the U.S. Government's Feed the Future initiative are well-conceived, build on existing evidence, and fill critical evidence gaps, the Bureau for Food Security (BFS) in the United States Agency for International Development (USAID) is providing resources for a comprehensive assessment of existing evidence and gaps in knowledge for each of six themes covered by the Feed the Future Learning Agenda. Concerned staff of USAID in headquarters and country missions and staff of USAID's implementing partners are expected to be the primary users. This paper provides the assessment for Theme III: "Expanded markets, value chains and increased investment."

The stated aim of Feed the Future is to tackle the root causes of global hunger and poverty through inclusive agriculture sector growth and improved nutritional status. This paper examines available evidence on the impact of investing in value chain development as a means of reducing poverty and chronic malnutrition.

For multiple reasons, few data exist on which types of value chain investments reduce poverty. Studies of value chain projects are few in number, produce results that can rarely be aggregated, typically lack rigor, and generally fail to measure impacts on poverty. However, the limited data that are available suggest that value chain interventions can significantly contribute to poverty reduction by increasing the competitiveness of specific value chains and their service markets. Some value chain projects have shown impressive results in terms of increased yields, incomes, and job creation. Few value chain projects to date have focused on achieving nutritional outcomes.

Good practices are emerging from value chain programs that are deliberately seeking to target the very poor. These include investing in analysis of markets, poverty and vulnerability; building in mechanisms to mitigate shocks; ensuring complementarity with social protection programs; investing in multiple complementary value chains; and addressing constraints in the enabling environment. But more research is needed to understand the trajectory of impacts on poverty, including the benefits accruing to the poor as producers, laborers, service providers, and consumers; the importance of income diversification outside of value chain engagement; and the role of links to investments in human capital development and consumption smoothing.

In terms of generating lasting change, value chain interventions have successfully developed local institutions and institutional arrangements through a focus on building trust in relationships. Widespread behavior changes have been documented, although the sustainability of these changes can only be inferred until additional *ex-post* research is conducted. The literature indicates that small, low-risk investments to increase quality and yields are the most effective path for generating behaviors that promote value chain competitiveness among the poor.

Interventions most likely to attract private sector investment in agriculture include infrastructure development, policy reform and support for agricultural research and extension. While foreign direct investment (FDI) is increasing, the share flowing into agriculture continues to be very low. Innovative models that bring together multiple public and private stakeholders to drive investment in agriculture should be researched to test their scalability and sustainability.

Although bank lending to agriculture currently constitutes less than 10 percent of total loan portfolio, loan guarantees are proving successful in leveraging additional lending. Innovations such as insurance mechanisms, leasing, capital venture funds, warehouse receipts, and non-traditional service points are currently being piloted and appear promising. FDI raises concerns about "land grabbing" but presents opportunities to transfer skills, introduce standards, and stimulate investments in infrastructure

development. Farmers' own savings, generally accrued from non-farm work, are a source of investment that warrants additional research.

The literature supports claims that investments in roads, water and sanitation, energy, and telecommunications all have impacts on poverty reduction. Mobile phones have the potential to empower farmers with information leading to higher farm-gate prices. Other information and communication technology (ICT)-enabled innovations require more study, especially with regard to their cost-effectiveness *vis-à-vis* more traditional delivery methods.

Intra-regional trade in staples has not significantly increased in recent years because of poor transportation infrastructure and long distances between surplus and deficit areas. Data suggest that increased trade would result in greater price stabilization. However, the dynamics of the food trade are highly complex. For many African countries to compete with grain imports, for example, consistent production volumes would have to be generated at much lower cost than is currently the case. Although good for the urban poor, the impact on rural poor as grain producers would also need to be considered.

I. ABOUT THE LEARNING AGENDA

The objective of this paper is to summarize available evidence on key questions for the Feed the Future Learning Agenda Theme on expanded markets, value chains and increased investments, and document expert opinion on gaps in the scientific literature for this theme that are in most urgent need of attention.

Feed the Future is an initiative of the U.S. Government, undertaken in response to the commitment of global leaders at the G8 Summit in L'Aquila, Italy in July 2009, to “act with the scale and urgency needed to achieve sustainable global food security.” Feed the Future aims to tackle the root causes of global hunger and poverty through inclusive agriculture sector growth and improved nutritional status, especially of women and children. Feed the Future aims to achieve these objectives through several intermediate results detailed in the Feed the Future Results Framework: sustainably increasing agricultural productivity, expanding markets and trade, promoting increased public and private investment in agriculture and nutrition, supporting vulnerable communities and households to increase resilience, increasing access to diverse and quality foods, promoting improved nutrition-related behaviors, and improving use of maternal and child health and nutrition services. The Feed the Future approach focuses on smallholder farmers, especially women.

An important objective of the Feed the Future monitoring and evaluation (M&E) component is to generate evidence to address unanswered questions in the development literature pertaining to the causal linkages in the Feed the Future Results Framework. In line with USAID’s new Evaluation Policy launched in January 2011, Feed the Future’s M&E approach emphasizes generating, learning from, and sharing evidence and results that can inform future programming and investments, increasing the chance that future investments will yield even better results than in the past.

To organize this work, USAID’s BFS led the development of a Feed the Future Learning Agenda in the first half of 2011, composed of a set of key evaluation questions related to the causal linkages in the Feed the Future Results Framework. These questions were designed to be answered using evidence-based hypothesis-testing, primarily through impact evaluations but also through performance evaluations, economic analysis, and policy analysis. In June 2011, a meeting was held with key experts from implementing partners and other stakeholders—U.S. Government agencies, universities, research centers, non-governmental organizations (NGOs), think tanks, the private sector, and others—to review and validate the key questions and the thematic groupings into which they had been organized to form the Feed the Future Learning Agenda. These stakeholders also provided preliminary design ideas for impact evaluations to be conducted to address these questions.

To ensure that Feed the Future impact evaluations are well-conceived, build on existing evidence, and fill critical evidence gaps, BFS is providing resources for a comprehensive assessment of existing evidence and gaps in knowledge within the framework of the Feed the Future FEEDBACK project. This assessment includes annotated bibliographies and literature review papers organized around the six themes of the Learning Agenda:

1. Improved Agricultural Productivity;
2. Improved Research and Development;
3. Expanded Markets, Value Chains and Increased Investment;
4. Improved Nutrition and Dietary Quality;

5. Improved Gender Integration and Women's Empowerment; and
6. Improved Resilience of Vulnerable Populations.

Annotated bibliographies for each of the Learning Agenda themes have already been prepared. Literature review papers for each theme, including this one, present expert analyses of the current state of the scientific evidence for the key questions related to each theme and offer additional guidance on the gaps remaining to be filled by the impact evaluations. At a later stage, the assessment will also include activities aimed at articulating and demonstrating how new evaluations and studies conducted under the auspices of the Feed the Future M&E program contribute to filling the gaps in the body of evidence identified in this and the other five expert papers on the Learning Agenda themes.

II. ABOUT THE THEME: EXPANDED MARKETS, VALUE CHAINS, AND INCREASED INVESTMENT

USAID has invested heavily in projects taking a value chain approach. Between 1998 and 2010, USAID expended \$4.93 billion in 240 agribusiness and agricultural value chain development projects (Soroko & Phillips, 2011). The value chain approach advocates “understanding a market system in its totality: the firms that operate within an industry—from input suppliers to end market buyers; the support markets that provide technical, business and financial services to the industry; and the business environment in which the industry operates” (Campbell, 2008). This approach should, in theory, mean that value chain projects intervene in strategic parts of the system to address a range of constraints to value chain competitiveness.

However, in practice, most agricultural value chain projects focus overwhelmingly on two areas—increased production and improved linkages to local, regional, and export markets. This is reflected in the fact that most agricultural value chain projects aim to increase farm yields and incomes, with very few providing measurable evidence of poverty reduction, increased food security, improved nutrition, or female empowerment. The literature suggests that value chain projects can greatly increase their impact on the poor by focusing on a wider set of interventions—beyond production and market linkages—including policy reform, infrastructure development, and coordination with social protection programs to create graduation pathways out of poverty (Cuny Garloch, 2012).

III. KEY QUESTIONS FOR THE THEME

I. Poverty Reduction

What types of investments in value chain market-led development result in poverty reduction and improved nutrition among even the lower income quintiles in areas where value chain work is taking place? Which kinds of investments and in which value chain functions have generated increases in income and opportunities for employment among the poorest quintile, women, and other vulnerable groups?

Evidence

Introduction

For multiple reasons, few data exist on which types of value chain investments reduce poverty. First, the value chain approach is relatively new, with agricultural development projects only consciously adopting this approach during the last 10 years. Second, although the approach has several key features, tools and accompanying best practices,¹ it can encompass a wide variety of interventions. Third, measuring the impacts of this systemic approach poses methodological challenges—especially in establishing a counterfactual, which is required in conventional approaches to impact evaluation (Creevey et al., 2010). Finally, desired results of value chain interventions, such as poverty reduction, improved nutrition, and female empowerment, manifest themselves at the individual or household level, whereas most value chain projects measure change at the enterprise or industry level. Studies of value chain projects are therefore still few in number, produce results that can rarely be aggregated or generalized across projects, typically lack rigor, and generally fail to measure impacts on poverty.

One significant exception is an assessment based on a 15-year effort surveying Kenyan households and collecting income-related data, conducted by Egerton University's Tegemeo Institute. This study attributed a decrease in the poverty rate of 4.9 percentage points to three USAID-funded agriculture programs in Kenya² (Creevey, Dunn, & Farmer, 2011). In addition, data from other projects suggest that value chain interventions can have a significant and sustainable impact on poverty by increasing the competitiveness of specific value chains and their service markets, sometimes combined with complementary changes in the formal and informal enabling environment. Such interventions generally aim to increase yields, incomes (primarily, but not exclusively, for producers), and competitiveness in local, regional, or international markets. Few value chain projects to date have focused on achieving nutritional outcomes.

¹ See USAID's value chain development wiki: www.microlinks.kdid.org/vcwiki.

² Poverty was here defined as household members having incomes below \$1.25 a day.

Investments that result in poverty reduction

Significant past research claims that smallholder-led agricultural development is an efficient route to poverty reduction (Johnston & Kilby, 1975; Mellor, 1976; Thirtle, Lin, & Piesse, 2003; Lipton, 2005; and de Janvry & Sadoulet, 2010).³ Drawing on scientific literature and primary data analysis, Jayne and Boughton (2011) identify two key strategies to promote smallholder-led agricultural development. First are public programs and investments in the following areas: crop science and extension to increase smallholder productivity; access to equipment and inputs for the most asset-poor; road infrastructure and smallholder training in marketing to increase income from crop sales; and the adoption of grades and standards to facilitate trade. Second are policies to encourage private investment that supports smallholder commercialization, such as transparent triggers for government interventions in food markets, government–private sector consultations, elimination of export bans and import tariffs within regional economic communities, and closely monitored interventions to overcome market failures.

Evidence shows there are gains to be made outside of supporting smallholders as producers. Wiggins (2009) draws on the literature analyzing data from a variety of African countries to advocate for smallholder-led agricultural development as key to poverty reduction. He then references Dorward’s 2009 categorization of poor smallholders as “hanging in,” “stepping up” and “stepping out” (see Textbox 1) to clarify that not all smallholders will be willing or able to become commercialized producers. This is particularly relevant for donor-funded value chain programs, which have typically supported the poor in their role as producers.

A few studies demonstrate the substantial gains to the rural poor of switching from production on their own plots to providing labor on larger farms. Maertens and Swinnen (2009), for example, show that such a shift increased incomes by 60 percent (after controlling for bias) for the rural poor engaged in the French bean value chain in Senegal. Similarly, Masi, Setrini, González, Arce, and Servin (2011) examine the poverty-reducing effects of participation as producers in the fruit juice value chain, but conclude that to escape poverty, one or more family members must be employed as agricultural or non-agricultural wage earners. Value chain development can therefore benefit the poor in several ways—as producers, laborers, and service

Textbox 1: Intervention Strategies for Different Types of Poor Farmers

- *Stepping up* intensify farming through improving transport, facilitating access to inputs and credit, investing in technology and through farmer organization;
- *Stepping out* into the non-farm economy by more education and skills, better health care, and providing potential migrants with information on opportunities, conferring on them transferable rights as citizens, and facilitating remittances; and
- *Hanging in* providing social protection for those who have few assets and options, investing in technology for food staples to allow them to make best use of their small plots, and making sure that the next generation gets a better start than its parents through primary health care, infant nutrition, and schooling.

Dorward (2009) as cited in Wiggins (2009).

³ In brief, this research, based mainly on agricultural transformation in Asia, shows a trajectory of increased labor and land productivity on small-scale farms, leading to employment generation and off-farm income generation. This is followed by increased mechanization, a transition to larger farms, the exiting of marginal farmers from agriculture, and increased rural-to-urban migration.

providers. As Collins, Morduch, Rutherford, and Ruthven (2010) demonstrate, poor households engage in diversified economic activities and employ a variety of financial tools to meet regular needs and provide for emergencies.

The strengthening of market relationships is central to many value chain interventions that target the poor. Humphrey and Navas-Alemán (2010) reviewed 30 value chain projects, which they characterize as taking either a lead-firm approach (working with and through large buyers and suppliers in a value chain to strengthen their supply and distribution networks) or a market linkage approach (strengthening the linkages between market actors without focusing on one or more lead firms). Market linkage projects were found to be able to establish or strengthen value chain linkages with specific target groups such as the socially excluded, the geographically remote, or those working in value chains that included large numbers of the poor. They were therefore more successful at targeting the poor, although data on the projects' impact on poverty reduction were lacking.

Mitchell, Keane, and Coles' 2009 study highlights the importance of vertical⁴ coordination in increasing revenue flows to the poor, although the authors identify horizontal coordination (principally the formation of producer groups) as a common prerequisite for other forms of value chain upgrading. Seven case studies on using value chain approaches to reach the poor, commissioned by USAID's Office of Microenterprise Development (Creevey et al. 2011), also show positive results through strengthening market linkages: improved horizontal linkages increased social capital and economies of scale and new or transformed vertical linkages led to more effective flows of products and services, information, and benefits. Devaux et al. (2009) describe the transformative effects that can be achieved by facilitating communication among stakeholders all along the value chain. By bringing together a variety of value chain actors, including small-scale producers, relationships were developed, leading to "pro-poor innovation in the Andean potato-based food systems." Creevey et al. (2011) describe the wide variety of interventions included in the seven projects they studied but describe many as "designed to improve relationships and lead to upgrading of products, processes, functions, and market channels."

Related to market linkages is the concept of value chain governance,⁵ which is central to the value chain literature. As quality standards are introduced into value chains, buyers seek greater control over the chain to ensure compliance (Gereffi, Humphrey, & Sturgeon, 2005). Such shifts in governance patterns present both opportunities and threats to smallholder producers. In some instances, buyers are willing to invest in the chain to ensure quality, as is common in contract farming and agricultural outgrower schemes. Where buyers are willing to provide improved inputs, services and technical assistance, the cost and risk of upgrading can be greatly reduced for poor smallholder producers. For example, USAID's Ghana Agricultural Development and Value Chain Enhancement project supports a network of outgrowers by offering a range of services in return for product that is aggregated for sale. Although the project's performance evaluation is not rigorous (Dorsey, Armah, & Obeng Mensah, 2013), in combination with monitoring data (ACDI/VOCA, 2012), it indicates the potential benefits of such buyer-supplier relationships to lower-quintile farmers, who are prevalent in Northern Ghana.

Investments in the value chain or market system—with its interconnected and mutually interdependent actors and functions—make it possible to intervene at nodes that offer indirect links to a large number of small-scale suppliers or farmers (Creevey et al., 2011). Interventions reach so-called "indirect contact entrepreneurs" through their commercial relationships with direct contact entrepreneurs who are the

⁴ In the literature, "vertical linkages" are market and non-market interactions and relationships between firms performing different functions (i.e., operating at different levels) in the value chain. "Horizontal linkages" are market and non-market interactions and relationships between firms performing the same function (i.e., operating at the same level) in the chain.

⁵ Humphrey and Schmitz (2001) state that governance refers to "the inter-firm relationships and institutional mechanisms through which non-market coordination of activities in the chain takes place. This coordination is achieved through the setting and enforcement of product and process parameters to be met by actors in the chain."

project beneficiaries. Imitator entrepreneurs benefit from observing successful new practices and business models (see Figure 1). Through this approach, USAID’s Kenya Maize Development Program reached 384,925 smallholders between 2002 and 2010, and the UK Department for International Development’s Promoting Pro-Poor Opportunities in Commodity and Service Markets project in Nigeria reached 1.26 million farmers between 2004 and 2011 (PrOpCom, 2011).

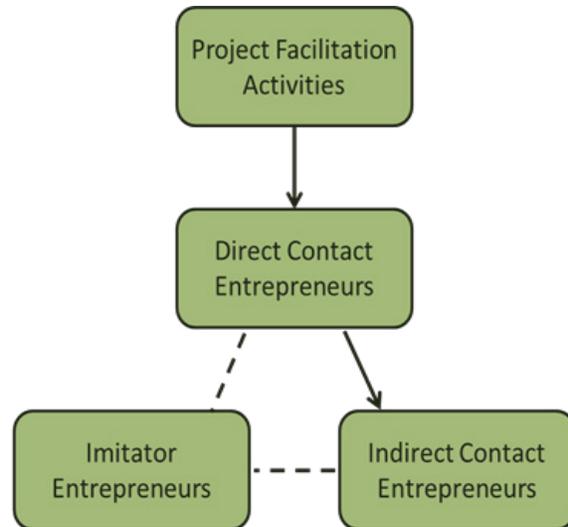
Investments that result in improved nutrition

Value chain researchers have only recently looked at nutrition, and the literature is consequently sparse in this area. Hawkes and Ruel (2011) conducted “an extensive search of the published and gray literature” and found only eight relevant case studies, with limited evidence of impact.

Ecker, Breisinger, and Pauw (2012) use cross-country analyses and economic modeling to explore the relationship between economic growth and chronic malnutrition in the process of development, concluding that “growth is good, but is not enough to improve nutrition.” Berti, Krasevec, and FitzGerald’s 2004 review of 30 agricultural projects with a nutrition monitoring component found that 19 interventions, most of which included nutrition education in addition to the agriculture intervention, had a positive effect on nutrition.

Figure 1.

Outreach through value chain projects



Source: Creevey et al. (2011).

Hawkes and Ruel (2011) describe the usefulness of the value chain approach for identifying why nutritious products are not available; why they cost as much as they do (and how they might be made cheaper); what is valued by customers (including nutritional value); where nutrition is lost; and what trade-offs exist between economic and nutritional benefits. Value chain interventions in some food crops may lead to lower consumption (as the crop is increasingly commercialized) or to a less diversified diet (as farming efforts focus on a few target crops). On the other hand, economic and nutritional benefits can be complementary. The authors provide the example of customers in Mozambique who were willing to pay price premiums of 17 percent and 54 percent for light and dark orange-fleshed sweet potato after having been made aware of its nutritional benefits.

Fowler and Irwin (2012) identify some emerging good practices for value chain projects seeking to contribute to food security objectives, including identifying the predominant food security challenges and their underlying causes prior to project design; tailoring value chain selection to address food security objectives; mapping nutritional changes of food products along the value chain; reducing per unit cost of foods while supporting the transition of marginal farmers into other functions or value chains; collaborating with other complementary programs; and incorporating explicit food security indicators, including nutrition, into monitoring and evaluation.

Value chain functions generating increased income

Since competitive value chains need all functions to perform effectively, it may not be meaningful to identify a particular function as key to increases in income and jobs. Further, value chains act as systems, with investments in one function impacting other parts of the chain, often in complicated ways. Mechanization of production, for example, can increase productivity and incomes for poor producers but displace workers, including the (near) landless, women, and other vulnerable groups. Simultaneously, this increase in productivity can trigger investments in processing that create new employment opportunities.⁶

The Millennium Challenge Corporation (MCC) references the systems nature of value chains (MCC, 2012): “Emerging lessons from MCC’s impact evaluations of five inclusive growth projects in agriculture identify the pitfalls of evaluating a single intervention in isolation of an overall theory of change and without understanding 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.”

This interdependence is also highlighted in an assessment of the Tanzania business enabling environment for maize and rice (Booz Allen Hamilton and DAI, 2010). Researchers found that key constraints to growth included inconsistent policy, a dearth of information and quality infrastructure, and a lack of trust among value chain actors. Together, these factors created inefficiencies in the market system and discouraged capital investment. Consequently, improving productivity and competitiveness was not a matter of intervening in any given function but rather in understanding and addressing the complexity of constraints, causes and potential solutions.

Results among the poorest quintile, women, and other vulnerable groups

The resource poor and vulnerable groups, including some women, generally require a more extensive set of interventions to ready them for upgrading within value chains. Consumption needs to be relatively stable before the very poor can take on the additional risk inherent in investing in value chain activities. Building on successful programs implemented by BRAC in Bangladesh, the Graduation Program of the Consultative Group to Assist the Poor (CGAP) and Ford Foundation are funding 10 pilots in eight countries to research models of sequenced interventions for graduating people out of extreme poverty. These interventions build the capacity of the poor to engage in value chains through: (1) safety nets to provide consumption support; (2) the transfer of productive assets linked to specific value chain activities; and (3) relevant skills training and financial services (see Figure 2 on the following page). Randomized evaluations are being conducted for eight of the 10 pilots.

⁶ For resources on the implications of intervening in complex systems, see <http://kdid.org/events/usaidppl-complexity-event>.

Goldberg and Salomon (2011) present the preliminary results of the first two randomized evaluations, both in India. After 18 months in the program, treatment households—which received limited and temporary cash support, training in livestock raising and petty trade, a savings account,⁷ and veterinary and health services—had a 15 percent greater consumption of food than control households. They also “reported lower food insecurity, received less food support from other households, saved more in their bank accounts, had greater health knowledge and improved perception of health over the past year, and had decreased symptoms of mental distress than those in control households.”

Figure 2. CGAP–Ford foundation graduation model



Source: El-Zoghbi, de Montesquiou, and Hashemi (2009).

Female beneficiaries reported higher levels of financial autonomy than those not receiving the intervention.” In a second followup assessment of one of the projects, “beneficiaries experienced a statistically significant shift in income source from agriculture to livestock (considered a more stable form of income), and were less likely to use government safety nets supplying pensions, housing and assets.” The pilot project in Haiti, working with 150 very poor women, reported that the total value of assets owned by the participants increased from approximately \$138 immediately after the assets were transferred to \$152–\$380 six months after the program’s end, indicating the women were able to grow their assets (Hashemi and de Montesquiou, 2011).

Bandiera et al. (2013) collaborated with BRAC to conduct a large-scale and long-term randomized controlled trial to evaluate the Targeted Ultra-Poor program in rural Bangladesh, which provides very poor women with assets and training appropriate for one of a range of possible business activities, from livestock rearing to small retail operations. By 2011, the program had reached 400,000 women, 80 percent of whom lived below the global poverty line of \$1.25 per day. Beneficiaries who chose to run a business experienced a 15 percent increase in labor productivity and a 38 percent increase in earnings (increasing their labor hours by 19 percent). The authors conclude that the program “lifts 11 percent of the eligible women out of extreme poverty. Measures of estimated effects are typically more pronounced after four relative to after two years, indicating that the program sets beneficiaries on a sustainable path out of poverty.”

Evidence Gaps

Very few evaluations of value chain programs measure impact on poverty. Humphrey and Navas-Alemán (2010) reviewed 30 donor value chain interventions for their effect on poverty reduction and found “the number of independent impact assessments of any kind was very small.” Furthermore, existing evaluations are inconclusive about the impact of interventions on poverty. For example, the MCC released its first set of impact evaluations in October 2012, which revealed that while output and outcome targets had been surpassed, there was no measurable increase in household income. These evaluations of farmer training activities in Armenia, El Salvador, Ghana, Honduras, and Nicaragua demonstrate the difficulty in drawing conclusions about poverty over a short period of observation (in some cases, only 1–2 years).

⁷ For information on the importance of microsavings accounts for the very poor, see Roodman (2011).

Impact evaluations of value chain projects conducted between 2008 and 2011 by USAID's Office of Microenterprise Development show significant results in terms of increased yields, incomes and employment. However, although the programs evaluated were implemented in geographic areas with high rates of poverty, changes in poverty rates among beneficiaries or in the population as a whole were not measured. Creevey et al.'s 2011 analysis of the monitoring and evaluation data of seven value chain programs presents impressive quantitative results for productivity, firm-level profits, and employment. But although poverty reduction was an overall goal in all the programs, only one was subjected to a poverty impact assessment as part of a review of three USAID programs in Kenya.

In summary, the vast majority of the data available measure *outcomes* that suggest reductions in poverty, rather than quantify *impacts* on poverty.

With regard to the impact of value chain interventions on nutrition, the Institute of Development Studies, together with the Global Alliance for Improved Nutrition, developed a Rapid Assessment Tool (Henson, Humphrey, McClafferty, & Waweru, 2012) to provide "a practical way of focusing value chain-based agricultural initiatives undertaken within the context of Feed the Future so that they narrow the gap between the goals of raising rural productivity and incomes and improving nutrition." The tool assesses agricultural interventions for their potential to improve nutrition for poor households, and identifies ways in which the private sector can contribute to making food value chains more "nutrition-friendly." This collaborative work was the focus of Feed the Future's Nutrition Global Learning and Evidence Exchange in December 2012. However, the tool has yet to be widely used, and so its usefulness cannot yet be assessed.

Good practices are emerging from value chain programs that are deliberately seeking to target the very poor, such as recent large-scale Feed the Future value chain programs, the seven projects profiled by USAID's Office of Microenterprise Development in 2011, and the Assets and Market Access projects (AMA CRSP, 2012). These include investing in analysis of markets (including labor markets), poverty and vulnerability; building in mechanisms to mitigate shocks (e.g., insurance); ensuring complementarity with social protection programs and systems; investing in multiple complementary value chains with low barriers to entry and/or cross-cutting capacities (e.g., inputs, irrigation, business skills); and addressing constraints in the enabling environment (e.g., land tenure, labor laws, women's rights).

But much remains to be known about the specific approaches and innovations that allow the very poor to benefit over the long term as a result of value chain development. Changes in the poverty levels of direct and indirect beneficiaries of value chain interventions need to be rigorously measured to identify successful strategies to reduce poverty through value chain development. This entails bringing the individual and household as units of analysis into the conceptualization of the value chain market system.

Improvements in nutritional indicators are increasingly included in Feed the Future value chain programs. Consistent with the value chain principles of facilitation, and the need to reach scale (e.g., a million or more rural households), such programs generally work through private sector firms and have limited—if any—direct interaction with beneficiary households. Monitoring and evaluation data are needed to ascertain whether behavior change communication around nutrition can be effectively scaled up through the private sector, or whether partnerships with other donor-funded or government programs will be needed.

Knowledge of the impacts on poverty of value chain investments will only come with longitudinal studies that use an observation period that extends well beyond three years and perhaps beyond five years. Understanding these impacts is particularly challenging in the dynamic contexts in which USAID invests: poverty impacts are unlikely to be linear given the shocks that many countries face on a regular basis. Credible evaluations will need to take into account the complexities of market systems and of addressing poverty within these complex systems.

2. Local Institutions and Systemic Behavior Change

Have interventions in agricultural value chain development led to the development of local institutions and systemic behavior change? What are effective pathways for generating that change?

Evidence

Introduction

A significant number of value chain interventions have successfully developed local institutions and institutional arrangements through a focus on building trust in relationships—both horizontally (e.g., farmer cooperatives) and vertically (e.g., buyer and supplier agent models). As value chains have developed, new service providers have entered or strengthened their presence in the market system. Widespread behavior changes have been documented, although the sustainability of these changes can only be inferred until additional *ex-post* research is conducted. The literature to date indicates that small, low-risk investments to increase quality and yields are the most effective path for generating behaviors that promote value chain competitiveness among the poor.

Development of local institutions and institutional arrangements

Interventions in agricultural value chains have had a transformative effect in many countries. Cunningham (2009) looked at the impact of cooperative formation in the dairy sector in India, driven by a government initiative entitled Operation Flood, implemented between 1970 and 1996. Cunningham writes: “Households in villages with cooperatives had higher average incomes from all income sources, higher average incomes from milk and higher average levels of employment. The creation of a national milk grid and the establishment of village cooperatives and district unions throughout India generated many jobs; as of the early 21st century, 11 million households were employed by dairy cooperatives.” Dorsey and Assefa (2005) report that USAID’s Agricultural Cooperatives in Ethiopia program, begun in 1999, reached 642 cooperatives and 673,000 farming households by 2004. The value of sales through the cooperatives multiplied 20-fold during the 5-year period, and cooperative union dividends multiplied almost 60-fold.

Interventions to link suppliers to buyers (who might act as aggregators for final buyers) have long been researched for the potential benefits that can accrue to both buyers and suppliers. Smallholder farmers have been profitably linked to input suppliers and buyers through mechanisms such as contract farming and outgrower schemes (Agar & Chiligo, 2008; Minot, 2011a)—although such arrangements have to be structured carefully to ensure that smallholders continue to receive benefits over the long term (Baumann, 2000). The introduction of agent networks for private-sector agro-input dealers has helped to create a “last mile” distribution system in many countries. In Zambia, for example, 14 firms worked with the USAID Production, Finance and Improved Technology program to provide agricultural inputs to more than 100,000 farmers through networks totaling about 600 agents (DAI, 2010). This led to changes in farmers’ behavior, including the adoption of new seed varieties and use of herbicides and chemicals to treat crop diseases.

In addition to horizontal and vertical linkages, value chain interventions have introduced a variety of new institutional arrangements to deliver services and represent their members' interests. These include equipment and livestock leasing companies (Bass & Henderson, 2000), warehouse receipt systems,⁸ private-sector technical service providers (Sebstad & Snodgrass, 2008), new quality seals (Corsin, Funge-Smith, & Clausen, 2007), and industry associations to engage in advocacy (Cooksey, 2011).

Systemic behavior change

USAID impact evaluations conducted between 2008 and 2011 by the Office of Microenterprise Development show significant changes in behavior resulting from value chain interventions, including increased collaboration; adoption of improved production technologies; and engagement in longer term, mutually beneficial buying and selling relationships (Dunn, Schiff, & Creevey, 2011; DAI, 2010; Sebstad & Snodgrass, 2008). Creevey et al. (2011) further analyzed these and other value chain projects to ascertain whether such changes were likely to be sustainable. They found that in addition to experiencing increased returns as a result of adopting new behaviors, there was evidence of replication by non-project beneficiaries, and innovations among beneficiaries that were not promoted by the project.

Achieving systemic behavior change that leads to improved productivity and competitiveness is strongly related to the quality and nature of relationships among value chain actors. Referring to the *cardava* banana industry in the Mindanao region of the Philippines, Boquiren and Idrovo (2008) describe how the problem of a lack of compliance with quality standards and market requirements at the farm and semi-processing levels was due more to poor relationships and a lack of trust than to the absence of technology *per se*. Helping farmers, intermediaries, and processors understand the entire supply chain, rather than focusing on only their part of the chain, helped to align their perceptions of quality, which influenced the way benefits (and risks) were shared among players.

The adoption of new behaviors by project beneficiaries can stimulate behavior change in additional actors in ways other than imitation or replication. Bloom et al. (2007) found that when producers were more knowledgeable about the market, the likelihood of group leaders engaging in fraudulent behavior was “significantly lower.” Dunn et al. (2011) found that when Indian smallholder farmers began selling into supermarket channels, traders began to treat the farmers differently, offering more options concerning where to sell and at what price. Many studies document changes in intra-household dynamics, such as increased decision-making power, as women begin to earn higher incomes (Kaaria et al., 2008; KIT, Agri-ProFocus, and IIRR, 2012; and many others).

Pathways for generating change

Gereffi (2013) contrasts two approaches to value chain development: strengthening the weakest links in the chain (generally local suppliers), or targeting lead firms as the strongest link in the chain—urging the private sector to develop local capacity or challenging lead firms to improve workers' and suppliers' terms and conditions. Barrientos, Gereffi, and Rossi (2010) analyzed the potential trade-offs between economic and social upgrading for firms operating in global value chains, cautioning that economic upgrading may lead to either worsening labor conditions and subsequent product quality risk, or rising labor costs and therefore risk to market share.

⁸ See <http://agarchive.kdid.org/library/warehouse-receipts-food-security-benefits-and-challenges-screencast> for an AgriLinks presentation on this topic.

More generally, Gereffi and the large number of researchers whose work is posted on the Global Value Chain Initiative website⁹ point to upgrading as a trajectory for sustainably increasing incomes and reducing poverty. Dunn et al. (2006) analyzed upgrading by micro- and small enterprises in nine value chains in eight countries. They identified four types of upgrading within the cases: process upgrading (increases in production efficiency), product upgrading (qualitative improvement in the product), functional upgrading (entry of a firm into a higher value-added level), and channel upgrading (entry of a firm into higher-value markets). Although the authors make it clear that the risks and benefits of these types of upgrading are context-specific, they also suggest that both risks and potential returns are higher for functional and channel upgrading than for process and product upgrading.

The literature identifies several precursors to upgrading in addition to horizontal coordination, referenced above. Wiggins (2000) states that demand felt at the farm gate was the main driver of agricultural growth, based on his review of studies of agricultural development in the 1970s and 1980s. “That demand arose variously from urban growth domestically, from linking farmers to these markets by better roads, or from parastatals offering farmers in remote areas pan-territorial prices that discounted the cost of transport.”

Aldana et al. (2007) found that skills development is necessary for the “market readiness” of producer groups. These skills fall into five categories: group management, financial skills, marketing, experimentation and innovation, and sustainable production and natural resources management.

Care must be taken, however, to ensure that value chain development is inclusive (Altenburg, 2007). Haggblade, Theriault, Staatz, Dembele, and Diallo (2012) drew on the literature and three case studies to provide recommendations for inclusive value chain development, including designing temporary interventions to stimulate private sector responses; finding points of leverage to affect large numbers of beneficiaries; and building coalitions with private sector actors to monitor value chain performance.

Schmitz (1998) points to the concept of “small riskable steps to upgrading” as an effective pathway for small firms to improve their productivity and competitiveness. This concept was applied in the context of the banana chip industry in the Philippines, where poor smallholders were able to apply incremental improvements in agricultural practices that resulted in the largest possible increases in yields and profits, rather than attempting to achieve full certification in Good Agricultural Practices (Boquiren & Idrovo, 2008).

Evidence Gaps

Although the benefits of value chain investments on systemic behavior are reasonably well documented, there is limited scientific literature on how to generate systemic behavior change in value chain projects—which is unsurprising, given the recent emergence of this aspect of the value chain approach. USAID’s Accelerated Microenterprise Advancement Project conducted some initial research into systemic behavior change (Creevey et al., 2011; Snodgrass, 2012). But additional research in the form of both case studies and more rigorous evaluations is needed to identify the efficacy and sustainability of strategies to stimulate systemic behavior change.

Since market systems are dynamic, it may not be sufficient to develop an efficient value chain; capacity may be needed within the market system to respond to changes in market demand, the business environment or the competitive landscape. Little is yet known about how to create this value chain “resilience,” and even less has been written about how to measure progress toward resilience.¹⁰ Case

⁹ <http://www.globalvaluechains.org/>

¹⁰ Initial thinking in this area includes Osorio-Cortes and Jenal (2013) and Snodgrass (2012).

studies of value chain development initiatives in volatile markets or environments are needed to identify how to strengthen the capacity of sectors to anticipate and adapt to change.

3. Interventions to Attract Private Sector Investment

What types of interventions (policy and regulatory reform; institutional strengthening; market development; public-private partnerships, etc.) have attracted private sector investment in agriculture?

Evidence

Introduction

Despite the variance in country contexts, the literature consistently indicates that the interventions most likely to attract private sector investment in agriculture are infrastructure development (roads, irrigation, and electrification), policy reform (including liberalization of the agriculture sector, land reform, and the development of regulatory institutions), and support for agricultural research and extension. The recommended interventions all contribute to reduced risk for investors. While FDI is increasing, the share flowing into agriculture continues to be very low due to the inherent risks of agriculture and the relatively long payback period for returns on investment.

Investment in agriculture and agro-industry

Nedelcovych and Shiferaw (2012) analyze government action designed to attract investment into agricultural value chains in Mali, Ghana, Kenya, and Ethiopia. They conclude that by prioritizing public sector investments in selected value chains in key areas such as irrigation, research and extension, and regulatory institutions, governments have been successful in attracting investment. Inadequate roads and electricity, and limited access to land and secure tenure remain constraints to private sector investment. Conversely, the authors note, government intervention in staple crop value chains—including *ad hoc* price controls, export bans, and import tariffs—has a strongly negative effect on private sector investment. USAID’s study of the rice sector in West Africa (Campbell et al., 2009) similarly identifies the confusing market signals caused by government responses to fluctuations in staple food prices. Diao et al. (2013) review current agricultural policies in Sub-Saharan Africa and find evidence that tax holidays, favorable land tenure arrangements, and adequate infrastructure (roads and electricity) can be effective in attracting FDI in agriculture and agro-industry.

Mhlanga’s 2010 comparison of investment data in Sub-Saharan Africa with business climate assessments reveals a correlation between six components of the World Bank’s Ease of Doing Business index and the number of companies present in a country. Measures related to obtaining credit (the Legal Rights Index and private bureau coverage) and the Investor Protection Index were found to be highly correlated with the presence of agribusiness enterprises.

According to the Grow Africa Secretariat (2013), in 2012, private-sector companies announced more than \$3.5 billion of planned investment in eight African countries under the New Alliance for Food Security and Nutrition.¹¹ These countries attracted 97 commitments from 62 companies, including 39 companies based in Africa. By April 2013, companies reported progress against 79 of these commitments, having invested more than \$60 million in activities that incorporate smallholder farmers into commercial, market-based activities.

¹¹ Those eight countries are Burkina Faso, Ethiopia, Ghana, Kenya, Mozambique, Nigeria, Rwanda, and Tanzania.

The Global Donor Platform for Rural Development’s analysis of private sector response to liberalization of the agriculture sector in Ghana,¹² however, found that while FDI was increasing dramatically (growing by 360 percent from 2010 to 2011), agriculture attracted the least share, which the authors attribute to investors’ desire to reap quick rewards, the inherently risky nature of agriculture, and high default rates of farmers. Similar results (but drawing on older data) were found for Tanzania.¹³

Investment in agricultural research¹⁴

Naseem, Spielman, and Omamo (2010) draw attention to the fact that it is not only the size of the investment that matters. Private-sector investment in developing countries in agricultural research and development (R&D) was \$862 million in 2000. The authors argue, however, that this investment is likely to have limited impact on poverty reduction, since there are weak private-sector incentives to target investments on the needs and opportunities of smallholder farmers. Pingali (2009) similarly warns of market failures in agricultural R&D, particularly for self-pollinated crops “or marginal production environments, such as drought prone environments, where subsistence systems continue to prevail and the risks of research failure are high.” In such situations, international agriculture research stations have played an essential role in stimulating private sector investments in technology adaptation, dissemination, and delivery.

Pray and Fuglie’s 2001 study of private investment in agricultural research in Asia during the 1980s and 1990s found eliminating public sector monopolies, reducing subsidies to public sector input firms, and allowing foreign firms to play a larger role in the input industry to be the most important policy changes to attract investment. The authors recommend “continuing liberalization of economies, particularly agricultural input industries; strengthening intellectual property rights; continuing to support public research to complement private research—national, provincial and international; and developing transparent regulations that are based on local concerns and science.”

The lack of success to date in establishing public–private partnerships for agricultural research is analyzed by Spielman and von Grebmer (2004), who found that public- and private-sector partners underestimated the costs and risks of partnership, discounted the need for brokers and third-party actors to manage research collaborations, and failed to learn from the experience and models of past and current partnerships. Lewis (2000) raised similar concerns about the different cultural perspectives, institutional approaches, and understandings of intellectual property rights assumed by public and private sector stakeholders. However, she took a more positive view of the advantages of partnering with private companies, including access to research tools, specific technical expertise, and “deeper pockets from which they continue support of research which USAID helped initiate.”

Investment in mechanization

Ashburner and Kienzle (2011) describe government interventions in India that stimulated increased investment in agricultural mechanization. These interventions included infrastructure development (roads, irrigation, electrification), price stabilization, credit provision, and support for agricultural research and extension. PrOpCom (2011) describe a more localized, facilitative approach to mechanization in Nigeria, where tractors were bought and sold primarily through a state-run scheme.

¹² Global Donor Platform for Rural Development. (2012a).

¹³ Global Donor Platform for Rural Development. (2012b).

¹⁴ For a more in-depth discussion of this topic, see *Feed the Future Learning Agenda Literature Review: Improved Research and Development*.

The project brought together a private tractor company, an organization of tractor owner-operators, and a large, private bank to demonstrate the market potential and facilitate financing (backed by a loan guarantee from the Central Bank) for private sales. The first 50 tractors sold were estimated to have created 2,244 jobs for farm laborers (due to additional land under cultivation) and tractor operators, and generated \$3 million in income for project beneficiaries, although the sustainability of the model remains in question.

Mrema, Baker, and Kahan (2008) conclude that the focus for investments in mechanization should be on medium-scale farmers and agribusinesses that can provide mechanization services to small-scale farmers and processors. The authors stress that “successful and sustainable mechanization cannot be established by direct public sector provision of mechanical technologies and services.” Nevertheless, the public sector can support mechanization through “the establishment of enabling environments, training and human resources development, the strengthening of local organizations, and research and development.”

Evidence Gaps

The current literature is relatively consistent in its recommendations for the necessary public-sector interventions to attract investment in agriculture and agribusiness. However, these recommendations are based on evidence from case studies, not the results of impact evaluations. The literature also shows a significant time lag between these interventions and private sector investment. Additional longitudinal studies of the impact of the recommended interventions on investment flows should be conducted.

Innovative models that bring together multiple public and private stakeholders to drive investment in agriculture are being piloted in a number of countries and documented in the gray literature. The scalability and sustainability of such models should be more rigorously researched. Assumptions based on examples from Asia in the 1970s and 1980s have yet to be proved directly relevant to more recently liberalized agriculture sectors in Africa; this is another topic that warrants further research.

4. Sources of Investment

To what extent do different sources (domestic debt, FDI, guarantees, etc.) of investment in value chains lead to new income and employment opportunities for vulnerable populations?

Evidence

Introduction

In general, bank lending to agriculture constitutes less than 10 percent of total loan portfolio, and microfinance institutions (MFIs) lend an even smaller share to the sector. Guarantees are proving successful in leveraging additional lending into agriculture. More recent innovations such as insurance mechanisms, leasing, capital venture funds, warehouse receipts, and non-traditional service points appear promising, but are currently still being piloted on a relatively small scale. FDI raises concerns about “land grabbing” but presents opportunities to transfer skills, introduce standards, and stimulate investments in infrastructure development. Equity investments, while on the rise, are still a small source of investment in the agriculture sector. Farmers’ own savings, generally accrued through non-farm activity, represent an often-neglected source of capital for farm upgrading.

Public and commercial banks

Mhlanga (2010) states that with the exceptions of Malawi,¹⁵ Tanzania, and Uganda, commercial banks in Sub-Saharan Africa lend less than 10 percent of their total credit to the agriculture sector, excluding agro-industry. The situation in Asia is similar: a survey of 6,000 households in two states in India found that 87 percent of smallholder respondents had no access to formal credit, and 71 percent had no access to a savings account in a formal financial institution (World Bank, 2007). Further, despite women's prominent role in agriculture, the share of female smallholders with access to credit is five to 10 percentage points lower than for male smallholders (Making Finance Work for Africa Task Force on Agricultural Finance, 2012).

The failure of public agricultural and development banks is well documented (World Bank, 1989; Adams, Graham, & Von Pischke, 1984; and others), but Trivelli and Piselli (2007) document an innovative former public bank in Guatemala. The Banco de Desarrollo Rural (Banrural S.A.) is controlled by a mixture of public and private shareholders, including producer unions, Mayan organizations, NGOs, small enterprises, and the general public. In 2007, it had 270,000 credit clients, with a delinquency rate of 0.87 percent, and 1.8 million savings accounts, most of which were micro-savings. Forty-eight percent of its micro-credit clients were women, and 60 percent of all loans were made in rural areas. Despite the bank's focus on rural areas and poor clients, its lending to agriculture remained low at 9.4 percent of total portfolio.

The reluctance of the financial sector to lend to agriculture has likewise been extensively researched. For example, Making Finance Work for Africa (2012) categorizes the reasons as follows: risks (general credit risk, agriculture-linked credit risk, political risk); high costs (for both lender and borrower); lack of collateral; lack of financial infrastructure (credit bureaus, payment systems, asset registries, etc.); overregulation and inflexibility; and few appropriate financial instruments due to a lack of understanding of agricultural risks and potential.

To offset this risk, between 1999 and 2011, the Development Credit Authority (DCA) made more than 300 partial credit guarantees to mobilize \$2.3 billion of private capital for more than 100,000 entrepreneurs in 67 countries. USAID has collected more in fees from banks (\$10 million) than it has paid in claims (the default rate is 1.75 percent); and currently more than one-third of the portfolio is in agriculture (USAID, 2013). On a smaller scale, the Alliance for a Green Revolution in Africa (AGRA) raised \$10 million as a loan guarantee for \$100 million in credit from Standard Bank for smallholder farmers and small agribusinesses in Ghana, Mozambique, Tanzania, and Uganda.¹⁶

Similarly, various insurance mechanisms are being investigated as a means of reducing risk. Agar, Dougherty, and Chalmers (2011) reviewed current and past initiatives, including innovations to overcome moral hazard and high verification costs, which are often inherent in such schemes. Innovations included radio frequency identification technology in India to reduce fraudulent claims; formal animal registration and an independent expert partner to verify animal loss (Malawi); and index insurance, which "removes the need for the insurer to make costly in-field assessments of actual losses. Crucially, it also opens the door for re-insurance."

USAID's Index Insurance Innovation Initiative (I4) partners with research institutions and private sector entities to design, pilot, and rigorously evaluate index insurance products for smallholder-based agriculture. I4 currently has pilots in seven initiatives in five countries.¹⁷ The World Bank, Global AgRisk,

¹⁵ Most of the investment in Malawi is attributable to the government's fertilizer and seed subsidy programs.

¹⁶ See AGRA website: www.agra.org/what-we-do/innovative-finance/

¹⁷ See www.feedthefuture.gov/model/index-insurance-innovation-initiative-i4

the International Livestock Research Institute, MicroInsurance, and others are similarly working in this area. Smith and Watts (2011) question the scalability and sustainability of agricultural insurance programs, based on basis risk and farmers' willingness to pay for agricultural insurance products. They conclude that better data are needed to create indexes that have an 85 to 90 percent correlation with crop and forage yields, and very low cost (potentially subsidized) delivery mechanisms need to be developed.

Alternative (non-bank) domestic debt

There are several examples of MFIs lending to agriculture. Caja los Andes in Bolivia, for example, had 47,000 borrowers at the end of 2002. It accepted household assets and non-registered land titles as collateral and hired loan officers with agriculture degrees to administer rural and agricultural loans, which constituted 10 percent of its portfolio (CGAP, 2005). Bai Tushum in Kyrgyzstan extended a mixture of crop, livestock, agro-processing, trade, and mortgage loan products to more than 35,000 clients.¹⁸ Between 2000 and 2003, its agricultural portfolio dropped from 95 percent to 50 percent of all loans in recognition of the significantly lower net revenues and higher risk of agricultural loans (CGAP, 2005). Today, 48 percent of the portfolio is in agriculture.¹⁹

The role of MFIs in agricultural lending is still very limited, however. A study of rural finance among the member countries of the West African Economic and Monetary Union found that only 3 percent of credit to the agriculture sector came from MFIs (Morvant-Roux, 2008). The potential role of MFIs in agricultural lending is, in part, constrained by policy. The World Bank (2007) reports that 40 developing and transition economies still have interest rate ceilings that make it difficult for MFIs to survive without resorting to nontransparent fees. In many countries, other regulations make it nearly impossible for MFIs to mobilize savings and accept deposits.

Understanding that investments in one part of a value chain (e.g., a processing plant) have the capacity to benefit all actors in the chain, value chain finance leverages relationships between firms in a chain to develop innovative financing arrangements. Agar et al. (2011) review more than 400 organizations and initiatives to identify constraints to agricultural and rural value chain finance, as well as innovations to overcome those constraints. Innovations include leasing, venture capital funds, warehouse receipts, factoring, mobile technologies, and non-traditional service points, among others. Value chain finance is a significant area of research and investment for USAID (Fries, Chalmers, & Grover, 2012; Chemonics, 2009).

FDI

Between 1990 and 2007, FDI in agricultural production tripled to \$3 billion annually (UNCTAD, 2009). When agro-industry is included, the amount is much higher, with FDI in food and beverages alone representing more than \$40 billion per year. However, Mhlanga's 2010 study of investment data for Sub-Saharan Africa shows that private investments are mainly directed toward high-value crops and non-traditional crops destined for export markets, although investments are also growing in food processing, transport, and marketing. UNCTAD's extensive World Investment Report finds that developed-country transnational corporations (TNCs) are dominant in input supply, processing, and marketing, but that FDI from the South is just as significant as FDI from the North in the realm of agricultural production. The study highlights benefits from TNC involvement in agriculture through FDI and contract farming as the

¹⁸ <http://www.mixmarket.org/mfi/bai-tushum>.

¹⁹ Personal correspondence with Shamshieva Gulnara Zhamankulovna, General Manager, CJSC MFBank Bai Tushum & Partners, June 3, 2013.

transfer of technology, standards, and skills; better access to credit and markets; and enhanced food safety. Impact on women is found to be mixed; they can be disadvantaged by the loss of traditional markets but may find new roles in the value chains, particularly in processing.

The impact of contract farming on the poor receives considerable attention in the literature. Glover (1994) found that “substantial income increases can and do result from contract farming” in addition to significant multiplier effects for employment, infrastructure, and market development. These positive results can be further strengthened through strengthening producer groups (Coulter, Goodland, Tallontire, & Stringfellow, 1999). Contract farming has been found to benefit the poor as laborers in addition to the less poor. Maertens and Swinnen (2009) conducted research on the fresh fruit and vegetables export chain in Senegal and concluded that export production on industrial estate farms produced the strongest positive effects on poverty reduction. The authors confirm the findings of Jaffee and Henson (2004) that quality and safety standards can serve as catalysts to countries or industries to “successfully (re)position themselves in competitive global markets.”

Dolan and Sorby (2003) provide a mixed view of the impact on women of shifting to employment in high-value agriculture industries. They conclude that this employment can increase women’s income and economic visibility but may also place additional demands on their time and result in insecure working conditions and poor workplace environments.

Concerns about “land grabbing” are common in the literature. Cotula, Vermeulen, Leonard, and Keeley (2009) found that land allocations were on the rise, possibly increasing in size (although this varied considerably by country), and—with most remaining suitable land already under use or claim—pressure was growing on higher value lands. The authors note that host country governments generally have weak institutional capacities to negotiate favorable contracts and ensure compliance. Foreign investment in land can unlock its productive potential and stimulate investment in infrastructure development, but may also compete with food crops in factor markets and displace land rights enjoyed by local communities (UNCTAD, 2009). Von Braun and Meinzen-Dick (2009) make recommendations for ways to protect the rights of the poor, including transparent negotiations, the engagement of civil society, leases or contract farming instead of lump-sum compensation, and careful environmental monitoring.

Equity investment

A small but growing amount of FDI in agriculture is in the form of equity investments. In its 2012 Impact Report, the Aspen Network of Development Entrepreneurs (ANDE) identified 293 funds, including 73 managed by ANDE members, which invest in small and growing businesses in emerging markets. These funds had an average target of \$52 million in fundraising, and reported \$28 million in committed capital on average per fund. Forty percent of these funds target Sub-Saharan Africa. ANDE reported that its members made \$229 million in investments to small and growing businesses in 2012, with the top three sectors being ICT, agriculture, and health.

Impact investments constitute a subset of equity investments. These are investments made into companies, organizations and funds with the intention to generate measurable social and environmental impact alongside a financial return. USAID helped establish the \$25 million African Agricultural Capital Fund (AACF), an impact investment fund for agribusinesses in East Africa. The Development Credit Authority guaranteed 50 percent of an \$8 million commercial loan from J.P. Morgan’s Social Finance Unit to AACF. The fund is also supported by \$17 million in equity investment from the Bill & Melinda Gates Foundation, the Gatsby Charitable Foundation, and the Rockefeller Foundation. AACF is expected to invest in at least 20 agribusinesses over the next 5 years.²⁰ According to Pearl Capital Partners, the fund

²⁰ Information obtained from the Feed the Future website: <http://www.feedthefuture.gov/model/african-agricultural-capital-fund>.

managers, AACF has target return expectations of around 15 percent annual compounded return (Fletcher, 2012).

In a similar vein, the African Agriculture Fund, launched in 2011, currently stands at \$151 million in private equity funding for agriculture, with a target of 25 percent of funds supporting agricultural production. Its capital is sourced from European bilateral donors and African development banks.²¹

The potential impact of such investments on smallholder agriculture is significant. A study of the impact of the Gatsby, Rockefeller and Volksvermogen-supported African Agricultural Capital investment fund profiled five investments that totaled \$2,567,000. The study showed these businesses benefited 1.4 million families in East Africa, providing improved seed to 860,000 farmers, buying produce from 5,000, and providing jobs for more than 700 employees, among other results. The companies saw a 170 percent profit improvement and 15 percent customer growth (Fletcher, 2012).

Savings

The Comprehensive Africa Agriculture Development Programme (2003) noted, “There is an urgent need to increase domestic savings rates in Africa. According to the World Bank gross domestic savings rates in many countries are barely 5 percent or less of the GDP [gross domestic product], relative to levels of 20 percent or more in even poor Asian countries. Improving rural people’s access to credit and improving rural financial infrastructure will help mobilize savings. Most of the private sector on-farm investment will have to come from farmers’ own current income. An increase in both public and private agricultural investment therefore depends fundamentally on rising earnings and savings for farmers.”

The Food and Agriculture Organization’s (FAO) 1998 State of Food and Agriculture report reviewed household survey results from 100 studies focusing mainly on farm households in Africa, Asia and Latin America. It concluded that in Africa, non-farm income is usually the main source of cash, or is a “collateral substitute” used to obtain credit. Field survey evidence from Burkina Faso, the Niger and Senegal showed that access to non-farm income was crucial for purchasing farm inputs such as peanut seed, fertilizer, and animal traction equipment. The authors write: “This can create a dynamic effect, as cash from the non-farm sector is reinvested in farm equipment, thus creating capital that substitutes for labour and reduces farm labour demand.”

Evidence Gaps

As noted by Carter (2012), the role of agricultural insurance in lowering risk for investment is still being explored. Pilots in Ethiopia and Mali are examining the effect of risk index insurance on the supply of and demand for credit.

Credit guarantees are a proven model for stimulating investment, but there is little in the literature about how to scale up the model or increase its sustainability.

Innovations mentioned above (leasing, venture capital funds, warehouse receipts, factoring, mobile technologies, non-traditional service points, etc.) are still emerging, and should be researched further as they are rolled out more broadly to measure their success in stimulating investment that benefits vulnerable populations.

²¹ See http://www.phatisa.com/The_Fund_Manager/AAF/

Bannick and Goldman (2012) find that transitioning impact investing from growing individual firms to scaling entire sectors is an emerging trend. This trend should be tracked for its potential to benefit agriculture.

5. Infrastructure Investments and Poverty Reduction

What has been the impact of infrastructure interventions on poverty reduction? What is the impact when infrastructure investments are used in combination with more traditional value chain or productivity enhancing interventions?

Evidence

Introduction

The literature supports claims that investments in roads (particularly secondary roads), water and sanitation, energy, and telecommunications all have impacts on poverty reduction, although the relative importance of these priority areas varies by country. The emerging literature on the impact of mobile phones indicates their potential to empower farmers with information, leading to higher farm-gate prices. Other ICT-enabled innovations require more study, especially with regard to their cost-effectiveness *vis-à-vis* more traditional delivery methods.

Roads, R&D, and irrigation

In developing countries, 16 percent of the rural population (439 million people) lives in areas with poor market access, requiring 5 or more hours to reach a market town of 5,000 or more (World Bank, 2007). Approximately half of the agricultural area in these remote regions has strong production potential but lacks the infrastructure needed to integrate into the broader economy. Smallholder farmers' ability to respond to market signals is affected by the level of infrastructure. One study found that a 1 percent increase in output prices resulted in a 0.3 to 0.5 percent supply response in areas with poor infrastructure, and 0.7 to 0.9 percent in areas with good infrastructure (Pinstrup-Andersen & Shimokawa, 2006).

Fan, Hazell, and Thorat (2000) calculated the effects of various government expenditures in India between 1970 and 1993, and found that expenditures on roads and R&D had the greatest impact on agricultural productivity and rural poverty reduction. Investment in roads resulted in increased productivity (31 percent of benefits); new non-agricultural employment (49 percent of benefits); and higher rural wages (20 percent of benefits). Investment in transportation infrastructure was also a contributing factor to the success of the Green Revolution in a number of Asian countries, including Indonesia and China (Gabre-Madhin, Barrett, & Dorosh, 2003). The regional dimension of road infrastructure investments should also be borne in mind. One study found that a 50 percent reduction in transport costs in Mozambique would increase real agricultural GDP by 7 percent and also increase agricultural GDP in Malawi by 3 percent (World Bank, 2012).

Jayne and Boughton (2011) state that the highest perkilometer marketing costs for agricultural produce are incurred between the farm gate and the nearest motorable road. The cost associated with moving grain or fertilizer 25 kilometers on a dirt path by bicycle is approximately equal to the cost of moving the same product 500 kilometers along a tarmac road. This prioritization of investments in secondary roads is supported by research in Uganda (Fan, Zhang, & Rao, 2004). Dercon, Gilligan, Hoddinott, and Woldehanna (2007) found that access to all-weather roads in rural Ethiopia increased consumption

growth by 16 percent and reduced the incidence of poverty by 6.7 percent. Investment in irrigation infrastructure can also provide strong returns, although these vary by location and over time (Haggblade, 2007).

Table I draws on a six-country study by the Economic Intelligence Unit of *The Economist* (2008) and an analysis by the International Food Policy Research Institute (IFPRI) focused on India (Fan, Gulati, & Thorat, 2007) to rank the agricultural productivity and poverty reducing effects of government investments in Asia.

Table I. Ranking of government investments in Asia according to their impacts on agricultural productivity and poverty reduction

	Agricultural productivity		Poverty reduction	
	Economist	IFPRI	Economist	IFPRI
Policies	1		1	
Roads investment	2	1	2	1
Agricultural R&D	3	2	3	2
Extension services	4		5	
Credit subsidies	7	3	7	3
Fertilizer subsidies	5	4	4	4
Irrigation	6	5	6	5

Source: Jayne (2011).

Water and sanitation, energy, and telecommunications

In addition to roads, R&D and extension services, investments continue to be needed in public sector services. For example, Oshikoya and Hussain (2002) place a high priority on water supply and sanitation, in addition to transportation infrastructure, as most likely to promote pro-poor growth in Africa. In Sub-Saharan Africa, the absolute number of people without access to electricity is increasing and is expected to reach 660 million by 2030 (FAO, 2008). Canning and Bennathan (1999) find that investments in electricity-generating capacity are more profitable than investments in paved roads in 20 out of 51 countries studied, although returns are higher in low-income countries.

In their research on the impacts of ICT in Africa, Aker and Mbiti (2010) note that Sub-Saharan Africa has some of the lowest levels of infrastructure investment in the world. Merely 29 percent of roads are paved, barely a quarter of the population has access to electricity, and there are fewer than three landlines available per 100 people (World Bank, 2009). Yet access to and use of mobile telephony in Sub-Saharan Africa has increased dramatically during the past decade. There are 10 times as many mobile phones as landlines in Sub-Saharan Africa (ITU, 2009), and 60 percent of the population has mobile phone coverage. Mobile phone subscriptions increased by 49 percent annually between 2002 and 2007, as compared with 17 percent per year in Europe (ITU, 2009).

The impact of the explosion of mobile phone technology in Africa is suggested by evidence from Niger. Aker's (2008) research in Niger showed that an average trip to a market located 65 kilometers away can take two to four hours round trip, as compared to a two-minute call. Mobile phones also allowed people to obtain information immediately and on a regular basis, rather than waiting for weekly radio broadcasts, newspapers or letters. Furthermore, rather than being passive recipients of information, mobile phones allowed individuals and firms to take an active role in the search process, enabling them to ask questions and corroborate information with multiple sources.

Although the evidence on the impact of mobile phones in Africa is quite recent, an emerging body of literature assesses the role of information technology (more broadly) on market efficiency in developing countries, primarily in agricultural markets.²² These studies primarily focus on the relationship between mobile phone coverage and specific outcomes, such as price dispersion across markets, market agents' behavior, and producer and consumer welfare.

Research by Muto and Yamano (2009) estimates the impact of mobile phones on farmers' market participation in Uganda. Using a panel dataset on farm households between 2003 and 2005, they found that mobile phone coverage is associated with a 10 percent increase in farmers' probability of market participation for bananas, although not maize, thereby suggesting that mobile phones are more useful for perishable crops. This effect was greater for farmers located in communities farther away from district centers. Although the authors do not empirically explore the specific mechanisms behind their results, they suggest that improved access to price information reduced marketing costs and increased farm-gate prices, increasing productive efficiency.

A supportive policy environment is generally needed to facilitate private sector investment in the area of telecommunications.²³ Action for Enterprise (2013) outlines examples of agricultural input supply companies in Kenya and Zambia that are using ICTs to better manage their distribution networks and provide products, services, information and technical support to their farmer clients. A second paper (Action for Enterprise and ACDI/VOCA, 2012) looks at a range of commercial ICT initiatives in Africa, including direct deposits for payments to farmers, integrated global positioning and geographic information systems, bulk short message service and radio programs, soil testing to improve outgrower revenues, input tracking systems using barcodes, and supply chain management software, among others. The authors are clear that ICTs are a means to an end, however, "not a panacea." Technology can enable but does not replace "more traditional value chain or productivity enhancing interventions."

Evidence Gaps

The scientific literature does not include comparisons of the impact of stand-alone infrastructure investments with similar investments that are made in combination with value chain or productivity enhancing interventions. Although the gray literature suggests synergy between infrastructure and productivity enhancing interventions, quantitative data to support this assumption could not be found.

Research is also needed that compares the cost-effectiveness of ICT-enabled services with more traditional means of service delivery. USAID is a partner in two major ICT initiatives: the Connected Farmer Alliance in Kenya, Mozambique and Tanzania to leverage mobile phone-enabled solutions to improve supply chain efficiency and increase farmers' ability to access secure, timely payments and other financial services; and the mFarmer Initiative, which aims to support mobile network operators and service providers in launching agricultural value added services for two million smallholder farmers in emerging markets. Both initiatives appear to be having positive results, but no scientific research has been conducted to quantify the benefits.

²² See for example Abraham (2007); Jensen (2007); Aker (2008); and Muto and Yamano (2009).

²³ *The Economist*, "Let us in: Mobile money would transform even more lives in poor countries if regulators got out of the way," August 25, 2012.

6. Intra-Regional Trade

To what extent has the expansion of intra-regional trade in staples increased market access and regional availability and reduced price fluctuations and year-to-year local shortages?

Evidence

Introduction

Intra-regional trade in staples has not significantly increased in Africa, despite the negotiation of free trade agreements. *Ad hoc* export bans, poor transportation infrastructure, and long distances between surplus and deficit areas continue to constrain intra-regional trade. Evidence from Asia suggests that increased trade would result in price stabilization.

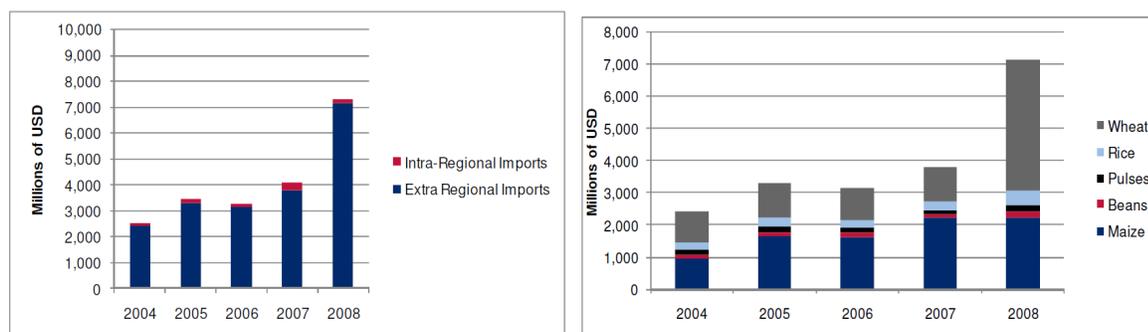
Intra-regional trade, market access, and regional availability

The failure to exploit the potential of intra-regional trade in Africa is well documented. The World Bank (2012), for example, states “Open regional trade is vital, especially as demand for staples becomes more concentrated in cities, which must rely on food production from throughout the continent. And different seasons and rainfall patterns and variability in production, which will increase as climate change continues, are not confined to national borders. Thus, an Africa food security model based on *national* self-sufficiency cannot work.” Yet the national strategies for agricultural development in many—if not most—countries in West, East and Southern Africa emphasize self-sufficiency as the path to food security, not regional trade (Campbell et al., 2009). This orientation was evidenced during the food shortages of 2008, when export bans on staple crops were ubiquitous. The FAO estimated that African cereal imports in 2008 were \$15.2 billion. However, just 5 percent of all grain imported by African countries originates from regional sources (World Bank, 2012).

Despite the existence of the East Africa Community (EAC) free trade area (comprised of [Burundi](#), [Kenya](#), [Rwanda](#), [Tanzania](#), and [Uganda](#)), and the [Common Market for Eastern and Southern Africa \(COMESA\)](#), a [free trade area](#) with 19 member states stretching from [Libya](#) to [Zimbabwe](#), intra-regional trade in staples remains relatively low. Makochehanwa (2012) conducted statistical analysis of the impacts of EAC, COMESA, and Southern Africa Development Community (SADC) trade agreements on intra-regional trade in maize, rice, and wheat for the years 2005 to 2010. The author found that during that period, Namibia, Rwanda, Tanzania, and Zimbabwe increased their intra-regional trade in the three staples, while Burundi, Malawi, and Sudan experienced declining levels of intra-regional trade in at least two of the three products. Of the 51 country-product combinations, Makochehanwa found that intra-regional trade increased in 25 cases, decreased in 16, and remained the same in the remaining 10.

An analysis of trade data for a basket of five staple commodities—maize, beans, pulses, rice, and wheat—reveals that the COMESA countries (plus Tanzania) are increasingly reliant on imports from outside the region to meet their food requirements (Chemonics, 2010). For the 2004–2008 period, intra-regional imports represented an average of about 4 percent of all non-locally sourced commodities. In addition, extra-regional imports for the five staple foods grew at an average annual rate of 31 percent, significantly faster than the 11.7 percent growth rate for intra-regional trade (see Figure 3).

Figure 3. Regional import value data with extra-regional import detail



Source: Chemonics (2010), with data from COMESA Statistics Database, and International Trade Center Trade map (for wheat import data).

Between 2000 and 2006, SADC's total exports doubled, but intra-trade as a percentage of total trade declined from 11 percent to 9.5 percent. Tekere (2012) states, "While maize is the key poverty-reducing product consumed in the region, generally there is no free maize trade in the SADC region as countries still invoke export bans at will." Furthermore, Chinembiri (2012) finds that bilateral and multilateral agreements between and among SADC members have no influence on the volumes of maize traded, but rather, that distance, transportation infrastructure, and sharing a common border are some of the most significant determining factors.

The Regional Agricultural Trade Intelligence Network (RATIN), in collaboration with the Famine Early Warning Systems Network (FEWS Net), monitors informal trade in rice, maize, and beans in Kenya, Uganda, Rwanda, and Tanzania. According to Lesser & Moisé-Leeman (2009), RATIN data show that informal cross-border trade (ICBT) in these three products increased by 65 percent from 2004 to 2006, to reach 418,781 metric tons (MT). During the three monitored years, Uganda's informal maize exports to Kenya totaled 361,716 MT, representing almost five times the volume of formal maize export flows. Nevertheless, these volumes remain small compared to the volumes of extra-regional imports.

In Southern Africa, FEWS Net and the World Food Programme measure informal flows of maize, rice, and beans between the Democratic Republic of the Congo, Malawi, Mozambique, Tanzania, Zambia, Zimbabwe, and South Africa. ICBT in the three commodities totaled 464,400 MT for the 2004/2005 to 2006/2007 seasons, with maize representing 82 percent of sales volumes. Maize trade spiked in 2006 due to poor harvests, particularly in Malawi, but informal sales of rice and beans decreased over the three-year period (Lesser & Moisé-Leeman, 2009).

In West Africa, Campbell et al. (2009) assessed the intra-regional trade in rice and found almost all of the cross-border rice trade flows were of imported rice. Further, "almost all the trade from surplus areas to urban markets remains within the country of production due to sufficient domestic demand, high transport costs and customs formalities."

To conclude, in East, West, and Southern Africa there has not been sufficient intra-regional trade to significantly affect market access. Variations in intra-regional trade occur in the COMESA countries in reaction to rainfall deficits or political or climatic shocks. Although this trade improves regional availability on the margin, as demonstrated above, extra-regional trade has a much bigger impact on regional availability in Africa.

Intra-regional trade and impact on prices

Asia provides examples of the potential effects of increased trade. Dorosh (2009) describes trade liberalization in the 1990s in Bangladesh leading to the growth in rice imports from India, resulting in price stabilization. An export ban in India in 2007–2008 subsequently caused a 45 percent increase in the real price of rice. Similarly, in Afghanistan, imports of wheat and wheat flour from Pakistan since 2000 were substantial, causing similar prices in both countries. In 2007, Pakistan banned wheat exports, leading to “dramatically higher” prices for wheat in Afghanistan. On this basis, Dorosh recommends the following package of policies for South Asian countries: “(1) national stocks to prevent very large price increases, (2) reliance on international trade to limit the need for government interventions in most years, (3) promotion of domestic production through investments in irrigation, research and extension that is economically efficient when evaluated at medium-term border prices, and (4) targeted (ideally cash-based) safety net programs to address the food security needs of poor households.”

The effects of informal trade also indicate stabilizing effects. Tschirley and Jayne (2010) present data that indicates food crises in Malawi in 2001 and 2003 were eased by informal cross-border maize trade. Mozambique’s open borders to trade allow exports of surplus maize to the north and imports from South Africa in the maize-deficit south. This resulted in relatively stable prices even during 2001–2002, when neighboring countries experienced dramatic price increases (World Bank, 2005). In contrast, government interventions in response to food crises, such as export bans and price controls, have generally exacerbated the crises and driven up prices (Tschirley and Jayne, 2010). Statistical analysis of 60 price series from 11 African countries shows the price of maize in Africa has been more volatile than the world price (Minot, 2011b).

Haggblade, Govereh, Nielson, Tschirley, and Dorosh (2008) map informal trade in maize in three “market sheds” in Eastern and Southern Africa. They create simulations that suggest that modest cross-border trade flows in response to a moderate drought can cut price spikes by as much as 50 percent in the South East Africa market shed (composed of Malawi, Zambia, and northern Mozambique). The authors conclude: “The key policy instruments for encouraging cross-border trade include cessation of quantitative controls, tariff reduction, and harmonization of customs procedures. Regional trade associations—such as COMESA, SADC and EAC—provide fora for negotiating and enforcing regional trade agreements.”

Evidence Gaps

Until intra-regional trade in staples increases, it will not be possible to calculate changes in market access and regional availability, reduced price fluctuations, and year-to-year local shortages. Indications from Asia are that intra-regional trade is likely to stabilize prices.

The dynamics of food trade are highly complex. For African countries to compete with grain imports, domestic supplies would have to be stabilized at costs of production that are competitive with those of imported grain. Whether this can be achieved through investment in inclusive value chain development that reaches the rural poor is still unclear. Moreover, the impacts on poverty and food insecurity of investing in value chains that combine more intensive production systems for food staples with increased employment-generating opportunities further up the chain also need further investigation.

IV. BROADER QUESTIONS FOR THE THEME

The questions under Theme III of the Feed the Future Learning Agenda are extremely wide ranging—from issues of international trade, infrastructure development, and FDI to challenges in improving household nutrition and generating employment for vulnerable groups. As they are already so broad, they do adequately cover all the main issues. Nevertheless, while all impinge on inclusive value chain development, to meaningfully contribute to the gaps in current knowledge, a more focused formulation of the questions in most urgent need of attention would be beneficial.

In particular, focused research is needed to understand the different trajectories by which value chain development impacts poverty, including the benefits accruing to the poor as producers, laborers, service providers, and consumers. This research should include the importance of income diversification outside of value chain engagement, and the role of links to investments in human capital development (including nutrition, health, and education) and consumption smoothing (through asset transfers, social protection, and microfinance).

Value chain interventions to date have largely focused on working with agricultural producers. The evidence suggests that interventions at key leverage points along the chain²⁴ may have a greater impact on poverty reduction—for example, by working with product aggregators, buyers, and suppliers to drive systemic behavior change. The effectiveness of intervening at these different leverage points warrants additional research.

²⁴ For more information on the concept of leverage in value chains, see <http://microlinks.kdid.org/good-practice-center/value-chain-wiki/leverage-points>.

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