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Inclusive Value Chains to Accelerate Poverty Reduction in Africa

Johan Swinnen and Rob Kuijpers

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Johan Swinnen and Rob Kuijpers

LICOS Centre for Institutions and Economics Performance

KU Leuven

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Abstract

The rapid transformation of agri-food value chains in Africa and other developing countries has important implications for economic growth and poverty reduction. Policy makers increasingly recognize this but there is a need for a better understanding of what value chain transformation entails and what the main policy options are. This paper provides an overview and analysis of different value chain models that have emerged in the past decades and reviews the literature on the main development implications. We discuss and categorize existing policy initiatives that aim to stimulate inclusive value chain development. Based on this review we identify lessons and implications for policy makers.

1. Introduction

Between 1990 and 2013, Sub-Saharan Africa's poverty headcount ratio declined from 58 to 41 percent. While this marks substantial progress, the number of people living below \$1.90 a day today is, due to high population growth, in fact higher than in 1990 and by 2030 most of the world's poor will be concentrated in Africa. Economic growth alone is unlikely to lift these people out of poverty (World Bank 2014). There is therefore a need to better understand how to foster growth, while making this growth "inclusive" for the poor.

It is by now widely recognized that raising Africa's agricultural productivity will be key to do so (e.g., Collier and Dercon 2014; Barrett et al. 2017). Increasing the productivity of Africa's agriculture will require greater use of modern inputs (improved seeds, fertilizer, irrigation, mechanization) as well as better access to (high-value) markets. Value chain development (VCD) is increasingly advanced as organizational solution to this challenge. VCD interventions generally aim to increase the efficiency in value chains by improving the business environment or by temporarily supporting individual value chain actors, often with the aim of creating particular social or environmental benefits (e.g., improving the income of poor farmers). The essence of the more integrated VCD models is to involve all actors in the value chain and "link" smallholder producers with input companies, processing factories or marketing agents. Based on these arrangements, higher volumes of more consistent quality can be procured by the stakeholders in the chain in return for access to credit, agronomic knowledge, price premiums, and a reduction of production and market risks for the producers. Although increasingly larger amounts of public funds are invested in VCD initiatives, there is considerable discussion and uncertainty on the effectiveness of this approach (Devaux et al. 2016).

The emergence of value chain development as public policy can be explained by the rapid transformation (or "modernization") that has taken place in agri-food chains all over the developing world in the past two decades. Two aspects of this transformation have received much attention and have been identified as major forces of agricultural transformation. One development is the increase in (foreign) investments by modern retailers and processors in developing and transition countries. This development has often been discussed under the heading of the "supermarket revolution" (Reardon, et al. 2003). Much of this literature pointed at the challenges for smallholders and poor farmers to satisfy the demands imposed by these modern companies and their implications for the structure of the value chains. At the same time research on the impact of such investments in transition countries showed the important positive effects on technology transfer, productivity growth and value chain transformation for farms in Eastern Europe and beyond (e.g., Gow, Streeter, and Swinnen 2000; Swinnen 2007, 2006).

A second component of modern value chain development in developing and emerging countries is through trade ("global value chains") and how rich country standards are imposed on poor country producers and what the implications are of these for developing country agriculture and its farmers (e.g., Maertens and Swinnen 2009; Minten, Randrianarison, and Swinnen 2009).

An issue which has only recently received more attention is that of the development of modern value chains in staple crops, mostly limited to domestic chains in developing countries (e.g., Reardon et al. 2012)

In general these modern value chains have been significantly affected by changes in agricultural and food standards. Such standards are spreading rapidly and food production and trade are increasingly regulated through stringent public and private requirements on food quality and safety, and ethical and environmental aspects (Henson and Reardon 2005; Jaffee and Henson 2004).¹

Both public and private standards have become more stringent and more widespread.² Yet, the modernization of value chains, both domestically and internationally, has accelerated sharply during the past decades. Moreover, the growth has been strongest in where standards are most important, i.e. in the higher value products – which includes fruits, vegetables, seafood, fish, meat and dairy products. For example, the shift towards high-value exports has been most dramatic in developing regions (Maertens and Swinnen 2015). In Asia and in Latin-America, high-value products increased from around 20% of agricultural exports in the 1980s to around 40%. The process is similar, albeit slower, in Africa.

At the same time, (foreign) investment at various stages of these value chains has increased significantly. Increased investment has been triggered by several factors. The first reason is the wave of investment liberalizations in the past 20 years which have made it easier for FDI to flow in. The second reason is strong economic growth in emerging and developing countries, which has triggered increases in demand for higher quality products and, with growing urbanization as part of the economic development process, and increasing demand for retail and processed products in urban areas

In combination, these developments have resulted in changes in the way agricultural value chains are organised with increasing levels of vertical coordination, upgrading of the supply base and increased dominance of large multinational food companies (McCullough, Pingali, and Stamoulis 2008; Swinnen and Maertens 2007).

These processes have important implications for developing countries. Increased demand for high-value products and increasing prices in international food markets create opportunities for developing countries to realize economic growth through expanding and diversifying their agricultural exports. High-value agricultural exports entail an important potential for raising rural incomes and reducing poverty because of the high intrinsic value and

¹ Food standards have increased sharply during the past two decades and now play a dominant role in world agri-food trade (Aksoy and Beghin 2005). A number of factors contribute to explaining their recent increase (Swinnen and Maertens 2007). First, a series of major food safety hazards in high-income countries has increased consumer and public concern on food-borne health risks and created an increased demand of food safety. Second, rising income levels and changing dietary habits have increased the demand for high quality food. Third, consumers are also increasingly (made) aware of ethical and environmental aspects related to food production and trade, which has increased the need for specific standards related to these aspects. Fourth, the increased trade in fresh food products such as fruits, vegetables, meat and dairy products – which are either prone to food safety risks or subject to specific quality demands by consumers – have increased the need to regulate trade through standards. Fifth, the increased role of large multinational food and retail companies contributes to the increased importance of private food standards. Large retail chains put much emphasis on freshness, product quality and food safety (with potentially high reputational damage and loss in market shares from selling unsafe food (Henson and Humphrey 2010)).

² An illustration of the rapid increase in public food standards is the number of notifications of new SPS measures to the WTO. These have increased exponentially in the last 15 years (from a few hundred in the mid 1990s to almost 13,000 in 2011). Private standards are often more stringent than public ones (Fulponi 2007; Vandemoortele and Deconinck 2013). An illustration of the spread of private standards is the number of producers that are GlobalGAP certified. This number increased six-fold over the past decade and a half: from around 20.000 in the mid 1990s to around 120.000 in 2011 (Maertens and Swinnen 2015)

labor-intensive production systems (Aksoy and Beghin 2005; Anderson and Martin 2005). Many developing countries recognize the opportunities of the development of high-value agri-food chains as an important strategy to foster pro-poor growth.

Understanding the development implications of value chain modernization is therefore crucial, as agricultural value chains are a fundamental component of developing countries' growth and entail the potential to increase rural incomes and reduce rural poverty.

A key question is obviously what type of government policies, development programs and initiatives by various agencies and organizations can play a role in fostering the development of these value chains and the inclusive nature of them, in order to contribute to poverty reduction.

In this note we review some implications of these (agri-food) value chain developments for developing countries and poverty reduction and draw implications for donor funding and WB projects.

The remainder of this paper is organized as follows. In section 2 we identify the main drivers of agricultural value chain transformation. In section 3 we describe different value chain models that have emerged in practice and illustrate each model by examples. We then discuss to what extent smallholders are participating in these modern value chains (section 4) and the productivity and poverty effects of this modernization (section 5). In section 6 we briefly discuss the role of farmer organizations. In section 7 we provide an overview of value chain development initiatives by the (semi-) public sector and discuss the effectiveness of these initiatives. Finally, we draw on the analyses and the cases to present a number of lessons (section 8) and policy implications (section 9).

2. Institutional Organization and Governance of Value Chains

The liberalization of markets and firms across the globe in the 1980s and 1990s transformed value chains. In the pre-liberalization-era, the technology and product exchange at different stages of the value chain was primarily directed by the state. The shift to a market-led economy created much disruptions in input and output markets, but also introduced new competitive pressures, and created incentives for firms to improve quality and meet new consumer demand (Swinnen 2007).

2.1. Drivers of Value Chain Transformation/Organization

Value chain development by commercial actors is typically induced by the need for guaranteed safety of the supply, by the need for guaranteed quality of the supply, or by the need for a guaranteed quantity of the supply. These are required for the companies to realize economies of scale and/or to satisfy their sales requirements.

Ensuring product quality, safety and supplies often necessitates upgrading of production, transport and storage technology throughout the value chain. In a context of failing capital and technology markets and imperfect contract enforcement this often means that the private sector is forced to come up with innovative contractual solutions to make high-value production possible.

The organization of the value chain is therefore endogenous to the existing market imperfections and enforcement institutions, but like explained below, also to the nature of the commodity, and the nature of the production, transport, and storage technologies required.

2.2. Value Chain Organization and Market Imperfections

Let us start by considering a simplified value chain (Figure 1). With perfect markets, decisions to invest in high-quality production are made independently at each stage of the chain. Demand and supply for a product with certain qualities determines the price level and thereby the incentive to invest. A change in consumer demand for higher quality food, will in this way translate into a demand for high quality farm output and an incentive to invest for the farmer if profitable.

Notice that parallel to the flow of goods and inputs in the value chain there is a flow of finance (in the opposite direction). Access to finance (in the form of own liquidity or loans) at each stage of this chain is crucial as production costs and quality investments are carried in full by the individual actors. Moreover, costs of standard-related investments are incurred at the start of the production cycle, while payment occurs at the end, making access to capital essential to bridge this gap. This is especially the case in the agricultural sector where the duration of the production process is relatively long.

It is not difficult to see why this form of high-standard production might not materialize in the context of imperfect credit and input markets. It is well known that financial markets are often not working well in developing and emerging countries (e.g., Banerjee and Duflo 2014; Bardhan and Udry 1999). Poor farmers may simply not have the financial means to make the investment out of own savings and may not get loans from banks or other lenders. As a result, credit market imperfections and financial constraints will cause output market imperfections, and the failure to upgrade to high-standard production processes.

In addition to credit markets not functioning properly, developing and emerging countries' economies are also often characterized by other failing factor markets. In many instances, farmers are unable to acquire the fertilizer, seeds, technology, know-how and the labor that would allow them to engage in high-standard production. Dillon and Barrett (2014), for instance, study five countries and find strong evidence of factor market failure in each of them.

2.3. Other Factors

It was already pointed out that (factor) market imperfections play a fundamental role as a motivating element for value chain innovations. There are more factors which influence the specific value chain innovation, including the financial and technical capability of the firms downstream in the value chain, the risk of holdup (contract enforcement problems), the value in the chain, the type of standard (public or private), and the nature of the commodity (e.g., staple crop vs. high value cash crop or perishable vs. storable).

Imperfect enforcement of contracts and the threat of holdup (e.g., side-selling or price re-negotiation) necessitates private enforcement mechanisms, such as third party enforcement or self-enforcing contracts. These solutions are only feasible when sufficient value can be created by the contract (Swinnen and Vandeplas 2011). This is because a contract can only be self-enforcing when it benefits each party at least as much as their respective outside option

(taking into account reputational costs). This might not be possible if too little value is created by the contract.

Another important factor affecting the risk of hold up, and therefore the feasibility and sustainability of high-value contracts between value chain actors is the type of quality or standard that is being adhered to. It seems that especially the specificity of the standard (i.e. whether it is a public or a private standard) seems to be important here (Klein, Crawford, and Alchian 1978; Williamson 1985). If the standard is 100% private (e.g., farmers are required to install a company-specific traceability system), it will be difficult to sell the agricultural goods outside of the contract; if the standard is public (and thus mandatory for everyone), on the other hand, goods can be diverted much easier. Obviously, this distinction has ramifications for the feasibility and sustainability of agreements, which means that the various actors will design their value chain differently according to the type of standard.

In summary, there are multiple factors affecting the feasibility and sustainability of high value product procurement, which induces actors to come up with different value chain innovations. This means there is no one-size-fits-all solution, but that instead, we can expect a wide diversity in value chain designs—which is what we observe.

2.4. Institutional Innovations and Governance Models in Value Chains

Value chains that fail to bring forward high value (intermediate) produce not only affect the farm, but also all other agents in the chain. Input providers have lower profits since they cannot sell their inputs; processors do not get the raw material they need for producing high-standard consumer products; and consumers do not get the products they desire. All these agents have an incentive to make the farm meet the standard. Moreover, some of these agents (usually downstream) may have better access to finance than the farms, because they have more liquidity, are more likely to get loans, or because they can draw on other commercial activities. These agents can then consider whether it is profitable to set up different types of exchange systems (rather than the spot-market model) to help or induce farms to meet the standard, such that they can benefit from the functioning of the value chain with high-quality and/or highly sustainable production at the farm level.

Some value chain arrangements are rather loose arrangements while others are intensive forms of vertical coordination that come very close to complete ownership integration. Some contracts are initiated by downstream buyers such as processing companies, slaughterhouses, or supermarkets, while others are initiated by upstream suppliers such as feed milling companies. Also, farmers themselves, usually organized in farmer groups or cooperatives, can be initiators of vertical coordination schemes. Some contracting arrangements are rather basic, involving two contracting parties at successive stages in the food supply chain, while other value chain structures are more complex, linking multiple stages in the chain and involving multi-stakeholder agreements and partnerships. Below, we provide more details on these different forms and give empirical examples of their occurrence and importance.

Box 1: Value, Commodity Characteristics, and Chain Performance

The characteristics of the commodity, including its “value”, affect the chains response to price and policy changes, such as liberalization strategies. This it is not always understood very well, but it can have major implications. In particular the vertical organization of the value chain may play a very important role in determining the effects of policy changes and price reactions. The nature of exchange institutions in value chains, and in particular the role of vertical coordination, compared to spot markets (which are the typical exchange institution used in text books and in many trade models) can matter very much – and is endogenous -- in particular in environments where contract enforcement is difficult.

Commodity reactions to economic liberalizations in the 1980s and 1990s

In Swinnen, Vandeplas and Maertens (2010) we document how various agricultural commodities in Africa have reacted quite differently to the liberalization processes in the 1980s and 1990s, and that these output and productivity responses were not consistent with the simple “getting prices right” model predictions. For example, fruits and vegetables and staple crops have performed much better than “industrial crops” (such as cotton, tea, cocoa, coffee, sugar). Output and productivity increased significantly for fruits and vegetables and staple crops but declined for industrial crops.

Price effects cannot explain the variation across commodity groups in Sub-Saharan Africa. The differences in performance are, however, consistent with our model of vertical coordination in value chains as developed in Swinnen and Vandeplas (2011). For staples input requirements are generally low and therefore output growth has not been very dependent on VC. Instead, the sector benefited from liberalized prices and enhanced competition in spot markets, where many small private traders exchange products (Coulter and Poulton 2001; Fafchamps and Minten 2001).

In contrast, in the industrial crop sectors, the simultaneous lifting of price controls, introduction of competition, and associated collapse in state-controlled vertical coordination have caused major disruptions in input provision to farmers and led to below average output and productivity growth, despite a much stronger reduction in taxation than in other commodity groups. Input requirements are generally much higher in traditional export commodities than in staple food crops, and therefore the collapse of public input provision affected output and productivity much more.

There was strong growth in the fruits and vegetables sector—much higher than in industrial crops. An important—and rising—part of the growth came from high-value fruits and vegetable chains for exports. This sector grew very rapidly after the reforms. The high value in these chains sustained post-reform private investments in the sector and encouraged private vertical coordination with quality upgrading, interlinking (with both large and small farms), and input provision to farmers (Maertens and Swinnen 2009; Minten et al. 2009).

In summary, different experiences of these commodities in Africa are consistent with the arguments that the nature (and the endogenous emergence) of value chains are crucially important for understanding performance, development and poverty effects.

Commodity reactions to staple food price spikes in the 2000s

In Swinnen and Janssen (2015) we document how various agricultural commodities in Africa have reacted quite differently to the price spikes of the 2000s. We speculate that from “a value chain perspective”, the price increases, in particular in cereals, may have caused a “double whammy” effect in Africa: it increases the profitability of investing in cereals production and it enhances the capacity to enforce contracts—and thus access to inputs—in the cereal value chain. This appears consistent with data suggesting major differences between commodity groups in reactions to the price increases in SSA.

The post-2007 growth response has been particularly strong in the subsectors of cereal and industrial crops, the sectors which were lagging behind in the 1990-2006 period.

Per capita cereal production has increased by more than 7% per year on average since 2007. The growth has come both from an increase in area and, mostly, from an increase in productivity. Cereal yield growth in recent years (3.3%) is three times higher than before the food price increases.

3. Value Chain Models

3.1 Farm - Processor/Retailer Contracting (VC initiated by downstream buyers)

The most common value chain model is vertical coordination by downstream buyers to farmers. This coordination can vary from loose trading relations that buyers have with preferred suppliers, to marketing contracts in which agreements are made on the transaction, or production contracts that entail tighter coordination. Production contracts may stipulate details of the production process and quality characteristics of the produce. Production contracts sometimes also include the provision of technical and managerial assistance, inputs on credit or cash credit to contracted farmers to assist them to meet quality, safety or quantity requirements. This is illustrated by figure 2. Such interlinked contracts are well known in the traditional development literature for input provisions (e.g., Bardhan 1989; Bell and Srinivasan 1989).³

The rationale behind such schemes is that the downstream firm may have better access to credit than farms, because it has more collateral or more cash flow for financing the investment and faces lower transaction costs. The latter can be the case when the lead firm makes the investment for multiple suppliers (e.g., as part of an outgrower scheme) and benefits from economies of scale. Another reason why a downstream firm may be in the position to assist its upstream suppliers is because they are closer positioned to the final consumer and therefore might have better knowledge on consumer preferences concerning quality and sustainability.

The contract typically specifies an obligation to comply with buyer standards (which could be public or private) and a transfer of inputs (or credit, to make quality upgrading possible), linked to a purchasing agreement. Payment for these services is generally accounted for at the time of product delivery. The inputs that are provided can be rather simple such as specific seeds, fertilizer or animal feed. However, much more complex forms of technology transfer are also observed, especially in areas where product quality becomes more important and long-term investments are required. More advanced forms of contract-farming can include the provision of long-term technological improvements through extension services, technical and managerial assistance, quality control, specialized transport and storage services, investment loans, and investment assistance programs.

Buyer initiated forms of VC and contract-farming are common in many sectors. In the dairy sector, milk processing companies are usually the initiators of contracting. They set up milk collection centers and make agreements with farmers (individual farmers or farmer cooperatives) for the delivery of milk. These agreements can be loose agreements or entail stricter selling and buying obligations. Contracting in the milk sector usually includes some stipulation of the required quality in terms of fat and protein content, and acidity of the milk. Also in the fruit and vegetables sectors, contracting between supermarkets, processing companies or exporters on the one hand and farmers on the other hand is common.

³ Bell and Srinivasan (1989) define interlinked market transactions as a transaction in which the parties trade in at least two markets on the conditions that the terms of all trade between them are jointly determined. Interlinked market transactions always include an element of credit as they involve exchange of current for future claims. Apart from interlinked credit and output transactions, interlinked transactions also exists in land markets (landlord who provide tenants working capital) and in labor market (employers who give advances to laborers in return for a claim on their labor in peak labor demand periods).

There are many examples that illustrate the importance of interlinked contracting between farmers and retailers, exporters or processors. Some milk processing companies in China (Sanlu Group Co. & Jinniu Group Co) started their own breeding programs or included breeding farms in the VC system in order to provide their contracted farmers with cows and expand their operations. They also assist farmers in getting access to bank loans in order to be able to buy the cows, and act as guarantee for the loan. They offer farmers technical assistance, veterinary services and feed. This results in quite complex multi-stakeholder VC models that entail high levels of vertical coordination.

Studies on horticultural export chains in Africa document the provision of specific inputs (as seeds and specific fertilizer) as well as elaborate systems of technical advice and extension services to contracted farmers (Henson, Masakure, and Boselie 2005). For example, Minten et al. (2009) show that access to technological inputs was a major reason why poor farmers decided to sign up for the contracts with horticultural export companies. But similar interlinked contracting is observed in many other African value chains. Bellemare (2012), for example, shows it is common for exporters and processors in cotton, rice, barley, and tobacco to provide their suppliers with seeds, pesticides and fertilizer.

There are several studies on Eastern Europe and Central Asia which document complex and elaborate value chain contracting systems in the 1990s and 2000s in various sectors including sugar, dairy, barley, cotton etc. Cotton gins in Kazakhstan, for example, not only provided seeds and fertilizer, but also water to the cotton farms, with water irrigation systems being a crucial technological input for farms (Sadler 2006). Dries et al. (2009) and Van Berkum (2007) summarize evidence on dairy contracting systems from various countries showing extensive input and technology transfers. Important components are credit, animal feed, and technical advice, as well as investment loans for improved dairy cows and milk cooling tanks. Dries and Swinnen (2004, 2010) show, for the case of Poland, that interlinked contracting had a major impact on milk quality, both for small and larger farms. Similar systems are used in the dairy sector of Uganda, where processors, such as Pearl Dairy, provide farmers with high quality storage equipment and training on hygienic practices, disease prevention, and breeding.

Another interesting multi-stage example of input transfers in value chains is the barley-malt-brewing value chains, as documented by Van Herck et al. (2012) for Eastern Europe in the 1990s, and which is relevant for SSA with investments by all the major international brewing companies in countries like Ethiopia etc. All of them face the problem of sourcing sufficient high-quality barley and malt in order to produce high quality beer.⁴ Enhancing the malt quality required upgrading of the entire value chain. For this purpose, the brewing companies developed transfer programs, involving malting processors, barley farmers and seed companies. Assistance to farms can include seed supply and selection schemes, investment assistance, and advice on post-harvest storage and treatment. These programs were successful in both improving quality, as well as in improving productivity.⁵

⁴ Initially, the foreign multinationals imported malt from their traditional suppliers in Western Europe. However, afterwards they started to invest in the development of a local supply base. Besides logistical and operational reasons, this was also due to high import tariffs and exchange rate uncertainty.

⁵ For example, in Slovakia, a World Bank (2006) study showed that the yields of barley farmers supplying to Heineken were consistently higher than the average yields of barley producers in Slovakia.

3.2 Models involving intermediaries

Vertical coordination can also be initiated by intermediaries in the chain. Wholesalers may specialize in selling to a specific type of buyers, or even a number of specific companies, and become *dedicated or specialized wholesalers*. These dedicated or specialized wholesalers engage in vertical coordination downstream as well upstream in the supply chain. They make agreements with supermarkets or exporters for the supply of produce conform the buyer's quality requirements; and usually have long-term relationship with farmers to deliver the required volumes and quality.

Dolan and Humphrey (2000) for instance describe the pivotal role of dedicated exporters in the horticulture export value chains in Kenya and Zimbabwe. These exporters are on the one hand expected to collaborate with importers to develop new products for retailers and optimize packaging, storage, and transport. On the other hand, they have to ensure that produce sourced from contracted outgrowers complies with stringent retail requirements regarding the timing and reliability of supplies, product and production characteristics, and food safety.

Another model is that of *concessionaires* who are contracted by supermarkets to stock up and manage supermarket shelves for certain products. Concessionaires receive a percentage of the sales values for the produce under concession from the supermarkets and take care of produce supply and handling of produce (e.g., slicing, packing, labeling). Upstream in the chain, these concessionaires rely on systems of preferred suppliers.

In Section 6 we also discuss the role that cooperatives can play as intermediaries in value chains.

3.3 Farm – Input Company Contracting and Leasing (VC initiated by upstream suppliers)

Input companies can also be initiators of innovations aimed at making the high-standard value chain feasible and sustainable (see Figure 3). Like food processing companies, input companies also have problems because financially constrained farms cannot afford to purchase the appropriate inputs or technology. To assist farms in purchasing the inputs (and ensure payments), input suppliers have engaged in a variety of, sometimes quite unconventional, forms of contracting. Institutional innovations have focused on reducing financial constraints of farms by introducing credit schemes, by assisting farms in selling their products to improve their cash flow and liquidity, and leasing arrangements. Leasing is a specific kind of financial contracting, whereby the lessee (the farm) uses the equipment which is still owned by the lessor (the input company) by paying a periodical fee. In essence it is an in-kind loan, whereby the equipment forms the collateral (since the lessor keeps ownership). Leasing is often used by suppliers of lumpy technological solutions, such as machinery to “sell” technology to farms that have no access to credit or cannot come up with the necessary collateral for loans.

Sometimes upstream suppliers of farm inputs are initiators of contract farming. In the pork sector for example, multipurpose feed-milling companies and cooperatives supply feed, multiply pigs and sell live pigs in the market. For raising the pigs, they contract with farmers who supply housing facilities and labor. This is a tight form of vertical coordination. Through this system, the company controls the genetic quality of the pigs and also the quality of the feed, which are main determinants for productivity, meat quality and food safety. The required housing facilities for the animals are also stipulated in the contracts.

Other value chain innovations where input companies were part of, included more complex forms of contracting where they were part of an institutional design involving multiple partners. This is discussed next.

3.4 Bringing multiple VC agents together: Triangular Structures

Many processors or retailers are reluctant to provide loans to farms for significant quality investments. The reasons are obvious: they require substantial amounts of finance and with the increase in the size of the outstanding loans, the risk of delayed re-payment or default increases too. Processing companies have therefore reached out to financial institutions to see if they could collaborate in providing loans to farmers to make the necessary investments to meet the standard.

We refer to such institutional designs and collaborations as triangular structures (illustrated by Figure 4). The downstream company typically offers a guarantee to the financial institution if it provides a loan to a farm which has a supplier contract with the company. The guarantee is basically a promise by the buyer company that it will assume the debt obligation of the supplier in case of default. The underwriting is for specific loans for quality upgrading, related to the contract, and restricted for contracting farms. Triangular structures require a smaller financial commitment from the processor or retailer as the financing (loans) is now (at least partially) covered by the financial institution. The guarantee is also likely to reduce the interest rate for the farmer, as the guarantee lowers the risk for the financial institution.

The third party in a “triangular structure” can also be an input provider. In this case the buyer provides a payment guarantee directly to the company that sells the inputs. The logic is very similar to the case with the financial institution.

Guarantee programs within triangular contracting structures were implemented, for example, by sugar processors in Slovakia (Gow, Streeter, and Swinnen 2000), by retailers in Croatia for fruit and vegetable supplier investments in greenhouses and irrigation (Reardon, Vrabec, et al. 2003), and by dairy processors in several East European countries (Dries et al. 2009). These examples have been well documented because their effects were quite dramatic in terms of stimulating farm-level investments and productivity growth.

Also, in Africa we see the emergence of such triangular structures. For example, in Ghana, where the processor/exporter Profound Integration guarantees to buy fresh pineapples from six farmer cooperatives, while the input dealers agreed to supply those cooperatives with the necessary inputs on credit (Kolavalli, Mensah-Bonsu, and Zaman 2015). Profound Integration directly covers the costs of these inputs by deducting it from the payment to the cooperative.

3.5 Bringing multiple VC agents together: Special Purpose Vehicles

An even more complex way of improving value chain sustainability, is the use of so-called “special purpose vehicles” (SPVs). A SPV is a stand-alone company jointly owned by, for example, a processor, an input provider and a bank (see Figure 5). Typically, the SPV will then contract with the farms. The contract can include provisions on output, inputs, and credit.

An important advantage of such institutional solution is that the partners in the SPV now share the risk of contract breach. When a downstream company by itself implements input provision programs, it carries the entire risk of farms' breaching contracts, although both the input provider and the financial institution benefit from these contract innovations. Institutions such as SPVs allow sharing of the risk between various agents, and hence, will stimulate investments by companies who otherwise may be deterred by the risk.⁶

An example described in the literature is the case of the collaboration between the Russian dairy processor Wimm Bill Dann (WBD) and the Swedish dairy equipment seller De Laval. The goal of the joint project "Milk Rivers" was to upgrade the quality of production in Russian farms. They created a jointly owned "project", an SPV, which leased combine harvesters, milking and cooling equipment (World Bank 2005). Serova and Karlova (2010) found that a few years after the WBD-DeLaval project took off, competitors of WBD, started copying the scheme to stimulate dairy farm investments. They used a similar construction (also with DeLaval), whereby farms received milking equipment under a leasing contract as part of a one- to five-year instalment plan, as well as calf milk replacers (CMRs) and feed additives. These type of horizontal spillovers have been observed in multiple cases (e.g., see Gow et al. 2000), and can affect the entire agricultural sector.

3.6 (Complete) vertical integration

In some cases companies have gone as far as taking over the farming activities, i.e. by "vertically integrating" the supply of raw materials in their company. There are several motivations to do so. One is high transaction costs of market exchanges or high risks of hold-ups in contracting (Klein, Crawford, and Alchian 1978; Williamson 1985). Increasing quality and sustainability standards, especially private, may increase these transaction costs, in particular when monitoring is costly (e.g., restrictions on the use of pesticides and child labor). These costs of input transfer and monitoring are amplified when the capability of farmers is low and when standards are complex (as is often the case for private standards) (Gereffi, Humphrey, and Sturgeon 2005).

There are several studies which show how the rise of standards in high value chains and the associated requirement for farmers to invest in quality upgrading, has led towards vertically integrated production systems. Several studies have documented this for Africa. For example, Maertens and Swinnen (2009) and Maertens et al. (2011) document how, in the Senegalese horticulture sector, the combination of available land and a tightening of public and private standards (such as HACCP and GlobalGAP) induced exporters to move from smallholder contracting to integrated estate production. Similar shifts to vertical integration and large estate sourcing have been observed in other parts of Africa as well, such as in Ghana (Suzuki, Jarvis, and Sexton 2011), Zimbabwe (Henson, Masakure, and Boselie 2005) and Kenya (Dolan and Humphrey 2000).

Note, however, that in almost all of those cases, the shift towards vertical integration has only been partial, as processing companies maintained a mixture of sourcing channels. There are several motivations for this strategy. First, it might simply be difficult to acquire land,

⁶ In some cases such structures have developed with farmer participation (Gow and Swinnen 2001).

due to practical (e.g., high population and farm density in fertile areas) or legal constraints (e.g., foreign ownership of land not being allowed). Second, social pressures (e.g., from surrounding communities or international civil society) might induce large reputational costs from being associated with “land grabbing”. Third, maintaining multiple and diverse types of suppliers is part of a risk management strategy (Swinnen 2007). Suzuki et al. (2011) explain why Ghanaian pineapple exporters combine own-estate production with smallholder-sourcing to anticipate unexpected fluctuations in demand.

Interestingly, in the large grain producing areas of the former Soviet Union (Kazakhstan, Russia and Ukraine) extensive vertical integration has developed not so much to address product standards, but to overcome farms’ constraints in financial and input markets (Gataulina et al. 2006). Large agro-holdings sometime operate on thousands of hectares. It is not clear to what extent they can be a model for large scale investment in land abundant regions in SSA.

In some fruit and vegetable export sectors in China, there is tendency for export companies and packing houses toward procurement from own vertically integrated farms that are established in land leased from the government. Miyata et al. (Maertens, Colen, and Swinnen 2011) (2009) report that apple exporting companies source between 5% to 20% of primary produce from their own vertically integrated farms; and for onions this is between 30% to 70%.

In several Asian countries, including China, Vietnam and the Philippines, large-scale vertically integrated pig farms are emerging in peri-urban areas. These firms integrate different stages and activities of the supply chains in one single company. It is not uncommon for pig breeding, fattening, slaughtering, and meat processing to be integrated in a single company. These are often very large companies that are financed through foreign direct investment and that rely on imported genetic material and technology.

Different forms of vertical integration can be observed in the Ugandan dairy sector. The processor Jesa Farm Dairy Limited has, for many years, been sourcing half of their processing capacity (80.000 liter per day) from their own dairy farm in order to control quality and ensure supply. The rest is mainly sourced from contracted dairy farmers whom they offer price premiums. Whereas Jesa and the other cases presented above are examples of vertical integration initiated by a large downstream buyer of produce, vertical integration can also be initiated at the farm level. The Uganda Crane Creameries Cooperative Union, which is the apex body for over 100 primary dairy cooperatives in South-West Uganda, is in the process of establishing a processing plant in Mbarara. The necessary equity investment is paid from member contributions.

4. Smallholder Inclusion in Value Chains

An important way through which rural farm-households in developing countries can benefit from agri-food exports and the increased value in domestic and export sectors is through participating in contract-farming with domestic processors, exporters or overseas buyers. But whether or not smallholder farmers do share in the benefits from trade depends on the extent to which they are included in contract-farming arrangement and the impact that participation in contract-farming has on their incomes and well-being.

There is widespread concern that the structural changes (including tightening product and production standards) may lead to the exclusion of smallholder farmers from contract-farming schemes and hence from supplying to value chains. Contract-farming schemes may be

biased towards larger farms because of smaller transaction costs in buying larger quantities from few suppliers (Key and Runsten 1999). Standards might play an important role in inducing this shift towards vertical integration or sourcing from larger suppliers, and hence in the exclusion of smallholders. Small farms might be unable to comply with stringent requirements due to a lack of technical and financial capacity, which may induce traders and processing firms to reduce (or cease) sourcing from small suppliers. Also, transaction costs for monitoring compliance with standards might be very high in the case of sourcing from smallholders.

On the other hand, standards are themselves instruments for harmonizing product and process attributes over suppliers and can as such also reduce transaction costs in dealing with a large number of small suppliers. Moreover, well-specified contracts that include farm extension and assistance programs can alleviate the financial and technical constraints small farmers face in meeting stringent standards. In fact, high-standards contract-farming with tight contract-coordination and intensified farm assistance programs could provide a basis for constrained small farmers to participate in high-value export production. In addition, firms might prefer to contract with smaller farms because they might have a cost advantage – especially if it concerns labor-intensive production with relatively small economies of scale, such as fresh fruit and vegetable production – or because contract enforcement might be less costly with small suppliers.

The empirical evidence is mixed (Maertens, Minten, and Swinnen 2012; Reardon et al. 2009). Several empirical studies have documented that with increasing standards, a decreasing share of export produce is sourced from small farmers. For example, studies find decreased inclusion of smallholders in food export chains in Kenya (Dolan and Humphrey 2000; Gibbon 2003; Jaffee 2003) and Cote d'Ivoire (Minot and Ngigi 2004; Unnevehr 2000). Subervie and Vagneron (2013) describe the rise of large exporter-owned lychee plantations in Madagascar in response to rising private standards. Maertens and Swinnen (2009) document a shift from smallholder contract farming to vertically integrated farming on large-scale plantations in the vegetable export sector in Senegal with the increased importance of private standards, especially GlobalGAP. Also, Schuster and Maertens (2013) conclude that the spread of private standards, especially production standards such as GlobalGAP, in the Peruvian asparagus export sector has led to decreased sourcing from smallholders and that certified companies source significantly less from smallholders than non-certified companies. Some export sectors are even completely based on vertically integrated agro-industrial farming, without any inclusion of smallholder suppliers, e.g., the tomato export sector in Senegal (Maertens, Colen, and Swinnen 2011).

Yet, other studies show that smallholders continue to be included in modern value chains, sometimes exclusively. For example, several studies from Eastern Europe document that small farmers were integrated in modern agricultural value chains (e.g., Dries et al. 2009, 2009; Noev, Dries, and Swinnen 2009). Also, in Africa and Asia smallholders have been successfully integrated in several value chains. Minten et al. (2009) find that the vegetable export sector in Madagascar includes 10,000 smallholder farms and is based entirely on an intensive contract-farming system. Other examples where smallholders are to a large extent included in high-value export chains through contract-farming with buyers and exporters include fruit and vegetable sectors in Zimbabwe (Henson, Masakure, and Boselie 2005), Chile (Handschuch, Wollni, and Villalobos 2013) and Thailand (Kersting and Wollni 2012). Also, in Asia smallholders play an important role in these value chains. For example, export horticulture chains in China are found to be based almost completely on smallholder contract production

(Wang et al. 2009).⁷ Gulati et al. (Gulati et al. 2007) show that in many value chains in Asian countries there is an overwhelming predominance of smallholder producers based on contract-farming and innovative vertical coordination schemes.

In summary, the empirical evidence yields a mixed picture on the exclusion/inclusion of smallholder producers in global value chains through contract-farming schemes across sectors and countries.

To explain these different patterns of smallholder inclusion Vandemoortele et al. (2012) developed a formal theoretical model of the emergence of the demand for high quality and safe food and analyze which small producers are most likely to be included. They show that conditional on the initial production structure in the economy, the nature of transaction costs, and the possibility of contracting between producers and processors, certain producers are included in the high-quality economy, and others are not. Their model predicts that in a mixed production structure, with both smallholder farms and larger farm enterprises, smallholders are more likely to be excluded. When the farm sector is more homogeneous and dominated by small farms, it is likely that the emergence of high value production will be slower but more inclusive.

These predictions/arguments correspond to the conclusions by Reardon et al. (2009) who, based on the existing empirical studies, find that smallholders are especially excluded if sourcing from large farms is an option. They argue that reducing specific transaction costs (for example by investments in infrastructure, producer associations, third party quality control) can enhance the integration of small and less efficient producers in high-value value chains.

5. Poverty and Productivity Effects

5.1. Efficiency Premiums and Spillovers in Smallholder Contract-farming

How the participation of smallholder farmers in high-standards export production and trade contributes to rural income mobility and poverty reduction depends on whether and how much contracted suppliers effectively benefit from this participation. It has often been argued that the gains from high-standards agricultural trade are captured by foreign investors, large food companies and developing country elites (Dolan and Humphrey 2000; Reardon et al. 1999). Vertical coordination mechanisms and consolidation at the buyer end of export chains are said to amplify the bargaining power of large agro-industrial firms and food multinationals, displace decision-making authority from the farmers to these downstream companies, and strengthen the capacity of these companies to extract rents from the chain to the disadvantage of contracted smallholder suppliers in the chains (Warning and Key 2002).

⁷ Many examples of smallholder inclusion in high value chains come from the horticulture sector. One potential explanation for this is the high labor input requirements for crop protection and harvesting of vegetables and fruits, and the competitive advantage that smallholders have in accessing cheap labor compared to large estate farming. Whereas large farmers have to hire labor to produce these type of crops, smallholders can use family or community labor. The advantage of family labor over hired labor is that it avoids the principal-agent problem. Consequently, smallholders might have a comparative advantage as they do not bear the costs of sub-optimal levels of effort, supervision and labor output monitoring.

However, several empirical studies find evidence that is in contrast with these predictions. Generally, they find that once farmers are included in contract schemes and high-value export chains, they benefit significantly.

There is a lot of evidence of small to medium sized farmers improving their welfare as a result of participation in high value chains (almost always involving some type of contract farming); e.g., in products such as fruits and vegetables (e.g., Andersson et al. 2015; Handschuch, Wollni, and Villalobos 2013; Minten, Randrianarison, and Swinnen 2009; Subervie and Vagneron 2013), tobacco (e.g., Briones 2015), coffee (e.g., Bolwig, Gibbon, and Jones 2009), aquaculture (e.g., Hansen and Trifković 2014), dairy (Dries et al. 2009), poultry (e.g., Narayanan 2014), and cocoa (e.g., Jones and Gibbon 2011). There is also some evidence of positive welfare effects of participation in contract farming schemes around staple crops such as potatoes (e.g., 2012) and rice (e.g., Setboonsarng, Leung, and Stefan 2008). *A meta-analysis on the welfare effects of contract farming by Ton et al. (2016), based on 26 eligible studies (including many of the articles cited above), finds that contract farming has increased welfare of participating farmers by 62% on average (with a 95% confidence interval between 40% and 88%).*

Some studies report positive effects of participation in high-value contract schemes on food security, nutritional adequacy of diets, and health. Bellemare and Novak (Bellemare and Novak 2016) find that participation in contract farming schemes in more than ten different crops in Madagascar reduces the duration of the hunger season by an average of 8 days. Chege et al. (2015) show that participation by Kenyan vegetable farmers in supermarket value chains is associated with a significant increase in intake of calories (by 19%), vitamin A (by 96%), iron (by 18%) and zinc (by 15%). The positive nutrition effect is explained by increased income and an increased share of land under vegetables. However, these positive effects are partially suppressed (i.e. not as high as they could have been) by a higher likelihood of male control of revenues as a result of further commercialization of vegetable production. Asfaw et al. (2010) finds improved health outcomes among farmers as a result of the use of less toxic pesticides and improved farmers' pesticide management as specified in GlobalGAP requirements.

Swinnen and Vandeplas (2011) develop a theoretical model to show why buyers may pay suppliers an extra “efficiency premium” in high value chains, even with very unequal bargaining power in the contract relationship. The demand for higher quality products requires buyers to assist farmers in order to improve the quality of production, for example by providing the farmer with inputs on credit. In a context of weak contract enforcement, which is likely in many developing countries, this creates holdup opportunities for the farmer, who can decide to use the inputs but sell the high-value product to another buyer without paying back the credit that the first buyer offered him. In order to prevent this, buyers are forced to offer attractive contract terms in order to secure their returns to investment, for example by offering the farmer a price premium. Hence, poor suppliers can benefit from the introduction of quality standards in a weak contract enforcement context, even if all bargaining power lies with the buyer.

Xiang et al. (2012) simulate the general equilibrium effects of the growth in high standards food on household welfare. Their simulation results show that an increase in the worldwide or domestic demand for high standard food, leads to an increase in the production of high standard products and to a reduction of poverty and inequality. But the study especially illustrates the importance of taking into account that the growth and equity effects of high standards are determined by a complex set of factors and mechanisms that are often ignored in the empirical literature.

5.2 Technology Transfer and Access to Inputs Through Value Chains

Successful contract-farming typically involves technology and input. A crucial component in the benefits for local development are transfers since local suppliers do not have access to the required skills, know-how, technology, management, capital, inputs etc. In many cases to make these value chains functioning, this requires farm assistance programs, which can help to overcome constraints on domestic firms in low-income countries with limited access to capital and technology.

Several empirical studies document these technology transfers and the resulting productivity increases: see e.g., Dries and Swinnen (2010, 2004), Gow et al. (2000), Maertens and Swinnen (2009), Minten et al. (2009), Negash and Swinnen (2013).⁸ These studies find that technology (and management) transfer through value chains generates significant productivity increases both for the product itself and for other production activities at the farm level. For example, Minten et al. (2009) also find that the better technology and management practices related to contract-farming spill over to other crops, generating large productivity increases in rice production, and further improving the food security situation of rural households.

5.3. Benefits for the Poorest and for Women Through Labor Markets

An important – and much overlooked – issue in the welfare analyses of agri-food trade is that poor households may benefit through employment effects. High-standards trade creates new employment opportunities in labor-intensive processing and handling of produce, and on vertically integrated estate farms and large contracted farms. A shift from smallholder contract-farming to vertical integrated estate farming also entails a shift from production based on family labor to production based on hired labor. Hence, there might be additional benefits from agri-food trade through employment effects.

The empirical evidence on this issue is scarce but some recent empirical studies have documented that the development of such high value agro-industrial value chains creates substantial employment, for example in vegetable export sector in Senegal (Colen, Maertens, and Swinnen 2012; Maertens and Swinnen 2009) and in the cut flower industry in Ethiopia (Mano et al. 2011). According to the horticulture export association (EPHEA) the Ethiopian horticulture industry now employs 180.000 people of which 85% are women.⁹ Webber and Labaste (2010) report that approximately 7000 smallholders were involved in fresh vegetable export in Kenya, compared to 40.000-60.000 persons in the processing industry or as farm workers. In the vegetable export sector in Senegal, employment in agro-industrial production and exporting companies is well-accessible for the poor and this employment has a large positive effect on household incomes and on poverty reduction (Van den Broeck, Swinnen, and Maertens 2017).

The increase in standards may also create improved employment conditions for workers. Ethical or fair-trade standards may generate positive effects on working conditions. For example, Barrientos et al. (2003) find that labor standards and codes-of-conduct can improve workers' well-being, although not in all cases. Yet, even food quality and safety standards may

⁸ Similarly, Negash and Swinnen (2013) find positive effects on food security of smallholder biofuel value chains in Ethiopia because of spillover effects through fertilizer access.

⁹ <http://www.ehpea.org/GeneralInfo.aspx#medialink>, accessed 10 December 2016.

generate benefits for workers. By increasing the need for companies to invest in training, standards may result in higher wages through an efficiency premium paid to trained workers in order to stimulate them to keep working at that same company. Colen et al. (2012) find evidence of increased employment periods and higher wages for workers, following companies' certification to private standards in the horticulture export sector in Senegal.

Moreover, there seems to be a high demand specifically for female labor in these export sectors (Maertens and Swinnen 2012). Besides the direct effects, this further results in indirect effects such as increased child schooling (Maertens and Verhofstadt 2013) and investment spillovers (Maertens 2009). By creating off-farm employment opportunities for women, agri-food export sectors contribute significantly to female empowerment in rural households.

6. The Role of Farmers Associations

Many reports point at the role that farmers associations can play in integrating smallholders in value chains and in enhancing their bargaining position.

The first argument relates to the reduction of transaction costs in integrating small farmers in value chains. By contracting with an association of farmers (e.g., a cooperative) instead of by contracting with smallholders individually it may be possible to reduce the transaction costs for acquiring technology, meeting buyer requirements, farmer training, quality control etc. In terms of (joint) quality control, a farmers association could play an important role. Quality control is crucial for more than one reason. It is crucial to make sure that the buyer requirements are satisfied. However, if quality control is controlled only by the buyer there may be incentives for hold-ups under the form of opportunistic behavior in the quality control. Farm organizations can function as an organization that monitors food safety and quality standards (and hence reduces transaction costs for the buyer) and to provide guarantees on the correctness of the quality control (to protect the farms) (Moustier et al. 2010; Narrod et al. 2009).

A second argument is that farmers associations can reduce human and financial capital constraints for integration smallholders in value chains. The production of high value products typically requires training of farmers in particular production (and storage) activities. It is often argued that farmers associations can play a role through extension services etc. However, experts sometimes express skepticism on this issue as they argue that the product and process requirements in these value chains are often specific and go beyond the generic type of training that farmers associations typically provide, making this of little use for VCD.

A related argument is that through farmers' associations smallholders might have better access to finance which could provide smallholders the opportunity of making required investments which they otherwise could not. Farmers associations may also be linked with credit cooperatives which could further reduce farms' credit constraints.

The third main argument for farmers associations in value chains is to enhance farmers' bargaining power. Through collective action farmers may be in a stronger position in the chain to bargain for better contract terms (and vis-à-vis governments for better policies).

In combination, these efficiency and equity effects of farmers associations are often emphasized as important for enhancing smallholders' access to value chains and to improve

their contract terms, thereby making value chains more inclusive and thus reducing poverty among smallholder farmers.

Although people have advocated these arguments in many reports (and for quite a while), there is relatively little evidence that (a) farmers associations play an important role in modern value chains, and (b) that they are an effective institution to make modern value chains work and (c) that they enhance benefits of small farmers. Studies suggest that cooperatives can be a useful instrument but that they do not seem to be a simple solution to enhancing the value chain impact on poverty reduction, partially because they do not include the very poorest.

There is some empirical evidence that farmer associations can improve smallholder integration in high value chains (e.g., Kaganzi et al. 2009; Moustier et al. 2010; Narrod et al. 2009; Trebbin 2014; Wollni and Zeller 2007). Less is known regarding the role that farmer associations play in establishing (innovative) contract schemes¹⁰ or on the mechanism through which they affect VCD (e.g., reduced transaction costs in sourcing, improved access to technology, joint quality control, collective savings and credit schemes, or active knowledge exchange). Moustier et al. (2010) argue that in the case of the Vietnamese vegetable sector supermarkets prefer direct sourcing from cooperatives because it reduces the price (by cutting out collectors and wholesalers) and because it guarantees better quality. They argue that cooperatives are able to guarantee better quality because cooperatives collectively market produce (e.g., by using a common label), actively control quality, and facilitate better access to the training resources offered by the government's agricultural extension office.

There are several studies that show that cooperative membership improves the price received by farmers (Bernard, Taffesse, and Gabre-Madhin 2008; Chagwiza, Muradian, and Ruben 2016; Fischer and Qaim 2012; Wollni and Zeller 2007). This may be due to enhanced bargaining power of farmers through associations, but not necessarily. Price levels are likely to depend on the quality of the produce, the type of product, and the level of transaction costs (all potentially influenced by the cooperative) and are therefore not necessarily a result of improved bargaining power.

The overall poverty impact of farmers associations depends also on whether the poor actually participate in associations, such as cooperatives, and to what extent cooperative participation by poor farmers has an effect on their total household income. Obviously the two conditions are closely connected: those that do not expect to benefit are less likely to participate in a cooperative in the first place.¹¹ On the one hand one could expect the poor to benefit more, in relative terms, as they have the most to gain from collective action. On the other hand, due

¹⁰ One exception is the study by Jia and Huang (2011) on the role of producer organizations in downstream vertical coordination initiatives in Chinese horticulture.

¹¹ Verhofstadt and Maertens (2014) find that Rwandan cooperatives increase the average income of members by an estimated 155 USD per year and reduce the likelihood of being poor by an estimated 6.8%. Importantly, they also find that cooperative membership is ineffective in reducing poverty for land-poor households (<0.15 Ha) because the impact on their incomes is too low. In contrast, Ito et al. (2012) and Ma and Abdulai (2016) find that small farmers benefit more from cooperative membership than larger farmers. Ma and Abdulai (2016) estimate that cooperative membership increases the income of small-scale Chinese apple farmers (< 0.4 Ha) by 5.7%, which is higher than their estimates for medium sized (4.6%) and large sized farmers (3.8%). Ito, et al. (2012) find that smaller farmers benefit more than large farmers, also in absolute terms. They estimated that cooperative membership increases farm income of small-scale farms by 6 USD per day, which is twice as high as the estimate for large scale farmers. They note however that farmers with less than 0.2 Ha are not allowed to become a member at most of the surveyed cooperatives and are therefore not included in their estimates.

to their small size, they are likely to benefit less from cooperation in absolute terms, while the fixed costs for being a member might be relatively high.

Several studies conclude that asset poor households are less likely to be members of a cooperative (e.g., Bernard and Spielman 2009; Fischer and Qaim 2012; Ito, Bao, and Su 2012). Social capital, human capital, landholdings, location, and access to finance all seem to matter. Moreover, in some cases minimum land holdings is an explicit entry-criteria for joining a cooperative, implying that in those cases cooperatives are actively excluding the poor (e.g., Ito et al. 2012).

In summary, the empirical findings suggest that farmers associations can play a role in integrating smallholders in modern value chains and in enhancing their benefits. However, studies suggest that the very poorest may not participate in cooperatives and may therefore not benefit from their role.

7. Value Chain Development: Initiatives by Governments, Donors and NGOs

Governments, donors, and NGOs in developing countries are increasingly recognizing the importance of well-functioning and inclusive value chains for economic growth, agricultural productivity, employment creation, and poverty reduction. This makes inclusive value chain development (VCD) a strategy that is increasingly integrated in agricultural and development policies and programs in developing countries.

Two types of VCD interventions can be distinguished: *selective* interventions targeted at specific value chains or specific actors within those value chains, and *general* interventions that target the (business) environment in which value chains operate. These untargeted interventions include improvements in infrastructure, property rights, contract enforcement, corruption and the administrative burden of doing business. It also includes investments in human capital, public agronomic research, and general extension services. These types of interventions are not necessarily recognized as VCD interventions and often neither presented as such. They are, however, an important tool in improving the functioning of value chains, as they can lower transaction costs and reduce holdup problems. Moreover, a good business environment might make selective VCD redundant.

There are many forms of VCD that directly involve assistance to one or multiple value chain actors. Below we discuss and categorize the different approaches based on the primary engagement-point of the initiative. This can be the farmer, a downstream lead firm (processor, trader, or retailer), a service or input provider, or a platform, cluster, or committee of multiple stakeholders. Regardless of entry point, initiatives can be narrowly oriented or can have a broader and more integrated approach. Other dimensions on which initiatives vary are the implementation agency (public, semi-public, or private), finance modality (grant, subsidy, or (concessional) loan), and the intensity and length of public involvement (one-time or continuous).

7.1. Value chain development initiatives directed at farmers

One of the most straightforward approaches in developing inclusive value chains is direct assistance to farmers by an NGO or public extension agency. Farmers are often the weakest link in the value chain due to low capabilities, inadequate access to finance, technology

and output markets, and their relatively small size. Moreover, the fact that many VCD initiatives are motivated by improving the welfare of smallholders makes them a logical entry-point.

In its most narrow form, VCD directed at the farmer includes training of farmers in agricultural practices necessary for improving productivity or compliance with buyer standards. Nowadays, this approach is often complemented with activities to help farmers organize themselves in groups for collective exchange in input and output markets. The underlying assumption is that cooperation increases access to inputs and output markets and improves farmer bargaining power. This approach is for example practiced by many farmer field school initiatives, such as in the Agricultural Sector Programme Support in Bangladesh funded by Danida. During one crop season the project implemented by the Department of Agricultural Extension offers poor and small farmer households a number of training modules on simple agronomic techniques, homestead gardening, nutrition and group formation.

More integrated and intensive forms of VCD go further in improving farmer linkages with other up- and downstream value chain actors. For example, by representing the farmer groups in coordination and negotiation with other input distributors and potential buyers or by supporting key service providers (e.g., in collection, storage, transport, distribution of inputs). This approach is, for instance, practiced by the NGO Solidaridad in the horticulture, aquaculture and dairy sector of South-West Bangladesh. They have an intensive 5-year long program in which they are continuously coordinating their farmer assistance to buyer needs and requirements. The project also provides technical and financial support to poor landless households in project villages to become small-scale entrepreneurs in providing services to farmers in the community. This includes input distribution (small shops), output collection, and transport.

A successful example of Solidaridad's efforts is the collaboration with a large domestic retailer (Agora) with whom they introduced a high-quality mango variety on the shelves of the supermarkets of Dhaka. This mango is sourced from contracted farmers who are supported by the project in integrated pest management and post-harvest practices (i.e. hygienic handling of produce, grading, sorting and packaging). The pilot project is considered a success by the retailer and demonstrated that product differentiation for the domestic market can be a profitable strategy. Solidaridad expects this will lead to future spillovers in the form of further product differentiation at the supermarket level and an increase in contract farming in high value fruits and vegetables.

An important concern for these initiatives is the sustainability of the established linkages between farmers and the rest of the value chain. Once the public funding to the NGO ceases it will necessarily stop representing these farmers. Whether the linkages can be sustained will then depend on whether the farmers have sufficient capacity to keep themselves organized and to keep agreements with input providers and buyers in place. This makes an exit-strategy for these types of initiatives essential for long-term effectiveness.

7.2. Value chain development initiatives directed at downstream lead companies

Access to finance is a prerequisite for private-sector-led value chain development (see section 2 and 4). An alternative way for donors and governments to facilitate value chain transformation is therefore to finance downstream lead firms to develop the value chain(s) from which they source their produce (i.e. making them more inclusive and sustainable). These types of interventions have recently seen a surge in popularity.

One example of a large-scale intervention working on global value chains is IDH (the Sustainable Trade Initiative) funded by the Dutch government. IDH forms public-private partnerships around a number of high-value commodities (e.g., cocoa, tea, coffee, cotton, flowers, aquaculture etc.) with leading agri-food multinationals (e.g., Mars, Unilever, Cargill, IKEA) to introduce voluntary sector-wide sustainability standards, such as UTZ certified and Better Cotton (IOB 2014). IDH lobbies at a pre-competitive level for sector-wide improvements in environmental impact, farmer income, and labor conditions, but also financially supports individual company proposals for value chain development, which can go beyond certification.

Box 2 : Criteria for Additionality

DCED (2014) presents six necessary conditions that must be satisfied for additionality of private sector development initiatives.

1. The company has insufficient funds to self-finance the project (within a reasonable timeframe).
2. The company lacks the knowledge or competencies to design and/or implement a business model in a way that maximizes poverty-reducing or other development impact.
3. Without the public subsidy, the company would be unwilling to implement the proposed business model and/or changes in operational standards because of a perceived negative balance of costs/risks and benefits.
4. The company cannot access the services offered by the publicly funded agency on a commercial basis – whether this is commercial bank funding or advisory support of similar quality.
5. The cost-shared project does not displace other companies already operating in the market, or that are ready to undertake the same project without public support.
6. The cost-shared contribution does not duplicate other donor-funded support – whether grant, in-kind advice, loan or equity.

For example, IDH in collaboration with Unilever and the Kenya Tea Development Agency has integrated the trainings for Rainforest Alliance certification into broader Farmer Field Schools. Also, via the Cocoa Productivity and Quality Program over 30 companies in the chocolate sector have applied for financial support to their field projects. Through this program 164,000 cocoa farmers (mostly in Ghana and Ivory Coast) are being certified and trained on agronomic and post-harvest practices (IOB 2014).

Another example is the private sector window of the Global Agriculture and Food Security Program (GAFSP) implemented by IFC. Through the GAFSP fund IFC provides several concessional loans to processors to establish or increase the capacity of processing facilities in developing countries. This often includes the establishment or upscaling of a high value sourcing system, including assistance to farmers to help them meet high-value standards.

Working through large lead firms guarantees scale and outreach. However, it also carries a number of risks that have to be mentioned. First, public finance to private-initiated

VCD might not be additional to initiatives that would have been carried out by the private sector on its own. This makes “additionality” of public funding a necessary condition for effectiveness (see Box 2 for six criteria for additionality).

Second, public finance for private VCD might create a relationship of dependence, especially when the farmers are trained to comply with company-specific standards. As explained before, if standards are company-specific, it will be more difficult for the farmer to profitably side-sell their produce to other buyers, giving the lead company less incentive to offer them a price premium.

Finally, NGOs and some multilateral organizations question whether, in general, the interest of the farmer is served best if VCD projects are designed and implemented by large lead firms. In reaction to these concerns, some private sector development programs, such as the Facility for Sustainable Entrepreneurship and Food Security, now demand the involvement of an NGO to represent the interests of farmers and wage laborers and to ensure the inclusiveness of the initiative. It is, however, unclear whether NGOs are capable of fulfilling this role, especially if they are becoming financially dependent on these partnerships and if they also fulfill a role as service provider within the scheme (e.g., providing farmer training).

Box 3: The EBRD Approach

Arguably more than any other development organization, the European Bank for Reconstruction and Development (EBRD) has focused on value chain development as an agricultural and rural development strategy. After the failure of more traditional rural development projects in the early years of economic and institutional transition in Eastern Europe and Central Asia (ECA), EBRD shifted to a VCD-based rural development strategy. Since the mid-1990s it has successfully assisted with a large number investments in and by agribusiness, food processing companies and retailers as part of a VCD strategy to transform, modernize, and upgrade agricultural sectors and farms in this region.

[See “Agribusiness” @ www.ebrd.com]

7.3 Value chain development initiatives directed at service providers, intermediaries or input distributors.

Sometimes VCD projects only assist a number of key intermediaries, service providers, or input distributors in the value chain to take away or reduce specific constraints for farmers in improving their welfare. One such example is the Integrated Seed Sector Development project in Ethiopia implemented by Wageningen University, which aims to improve and increase smallholder access to high quality and high yielding seed. The project lobbies for regulation that allows private production and marketing of improved seed varieties next to the government-controlled channel and is setting up local cooperatives for the production of improved varieties that are adapted to local agro-climatic conditions.

These types of projects are often the least integrated types of value chain development, working at one value chain linkage at a time. Lifting only one farmer constraint carries the risk that other constraints become binding instead. For example, the effects of improved seed use on agricultural yield depends on complementary agronomic practices, agro-climatic context and other input and output market imperfections. This type of intervention is therefore only suitable as part of an integrated approach (see the example of Solidaridad in Bangladesh), or in a conducive context where there is one primary binding constraint.

7.4. Multi-stakeholder platforms

Multi-stakeholder platforms (sometimes called “agri-business clusters” or “value chain committees”) are an alternative for direct support to individual value chain actors. Instead, the general aim of multi-stakeholder platforms for VCD is to facilitate a better coordination between value chain actors, identify common interests, share knowledge, develop new business opportunities and to act as lobby group for the common interest of its members. Membership to these platforms is generally not exclusive to value chain actors but can include governmental and non-governmental agencies and knowledge institutes.

This approach is, for example, described by Devaux et al. (2009). They show how multi-stakeholder platforms in the Andean potato sector of Bolivia and Peru, supported by the Swiss Agency for Development and Cooperation, led to several product innovations, which in turn stimulated innovative forms of value chain organization to respond to the new quality criteria. It is reported that these initiatives reinforced the capacity for collective action, teamwork and innovation, and led to higher farm gate prices, increased farmer revenue and more stable markets. They also report horizontal spillover effects, as other value chain actors imitated the products developed by the platforms. Moreover, as a result of the success of the program, policy makers and donors are increasing their support for future collective action for value chain innovations.

Kolavalli et al. (2015) describe how a multi-stakeholder platform in the pineapple sector of Ghana led to a triangular value chain system whereby a finance institution provides farmers with credit for inputs necessary to comply with the standards of a modern processor. This processor, in turn, pays the farmers directly, after deducting the cost of the inputs to pay back the credit to the financial institution.

7.5 Effectiveness of public initiatives for value chain development

The number of public VCD initiatives is large and growing, but there are only few rigorous studies available that have credibly investigated their effectiveness (see table 1). In a systematic review and meta-analysis based on 71 different projects Waddington et al. (2014) estimate that farmer field school participation leads to an increase in yields and farm incomes of 13% and 19% on average, respectively. They also find that effects on household income can be much higher (+150%) when farmer field schools are complemented by input and output market interventions.¹²

¹² It should be noted this estimate is based on a small sub-sample of projects resulting in high standard error (i.e. there is much uncertainty on the external validity of this estimate).

Another example of a non-integrated VCD project directed at the farmer is the Rural Business Development program, evaluated by Carter et al. (2016), in which farmers receive technical and marketing assistance and are financially supported in acquiring the necessary equipment and materials to implement their individual business plans. Carter et al. find no effects of this project on consumption expenditures. A plausible explanation for this, for which they present evidence, is that participation increases investments by the household, diverting potential increases in income away from consumption.

Two studies that have rigorously evaluated a more integrated value chain development project are Ashraf et al. (2009) and Cavatassi et al. (2011). Ashraf et al. (2009) finds that, as a result of the project, farmers experienced an income increase of 31.9%. Cavatassi et al. (2011) find an average treatment effect of \$200 per Hectare. However, small farmers (<1 Ha) do not seem to benefit due to input costs that have increased as a consequence of the project.

In summary, empirical evidence is limited but suggests that there can be significant benefits, especially if the public intervention is well integrated in a broader approach to stimulate access to value chains.

Table 1: Selected publications on public value chain development initiatives

Author	Type of intervention	Crop and Country	Methodology	Estimated Effects	Other remarks
Waddington et al. 2014	Non-integrated VCD directed at the farmer (farmer field schools (FFS) in some cases complemented by input and output marketing activities (FFS+))	Diverse	Systematic Review (134 studies of 71 projects)	Yields: FFS:13%↑ Farm income: FFS: 19%↑ FFS+: 150%↑	No effects found on neighboring farmers (no knowledge diffusion effects)
Ashraf et al. 2009	Integrated VCD directed at the farmer (Linking smallholder farmers to banks, providers of farm inputs, transportation services, and exporters such that they can deliver to the high value export channel)	Horticulture - Kenya	RCT	Household Income: Average treatment effect: Not significant Early adopters: 31.9%↑	One year after the evaluation ended horticulture production for the export market stopped due to more stringent EurepGAP requirements.
Cavatassi et al. 2011	Integrated VCD directed at the farmer + multi-stakeholder platform	Potato - Ecuador	OLS, PSM, IV	Farm Income: Average treatment effect: \$200/Ha↑ Small farmers (<1 Ha): Not significant Medium farmers (1-5 Ha): \$318/Ha↑ Large farmers (>5 Ha): \$111/Ha↑	Small farms had higher yields and sold more as a result of the program, but also had to bear higher input costs per hectare resulting in a net-farm income effect of 0.
Carter et al. 2012	Non-integrated VCD directed at the farmer (Farmers by providing technical assistance, marketing support, finance, materials, and equipment)	Beans, cassava, livestock, sesame, and vegetables – Nicaragua.	RCT	Household Consumption: Not significant	The estimated effect on consumption is non-significant for poor as well as wealthier farmers. They do find some positive effects on investment which may have offset the effect on consumption

Box 4: Some Key Points Summarized

When do value chains “work”?

Value chains are more likely to overcome imperfections in credit and technology markets

1. If the total surplus created by the value chain is higher (“high value”);
2. If the costs of contract breach (incl. reputation costs) are higher;
3. If the specificity of the contract/technology/product is higher (i.e. if the specific value of the product is lower for alternative buyers);
4. If products are perishable and/or require specific storage and processing;
5. If transaction costs in sourcing product are lower.

When do value chains include smallholders?

Smallholders are more likely to be included in value chains if

1. If the farm sector is more homogeneous (i.e. when there are only/mostly small farms in the region);
2. If sourcing from smallholders is “cheaper or not too much more expensive”¹ than sourcing from large farmers or vertically owned estates. This is more likely
 - a. for products for which smallholders have a competitive advantage, i.e. products that are labor intensive;
 - b. if transaction costs per farmer (for searching, screening, communication of requirements, technology transfer, quality monitoring, etc) are not (much) higher on small farms;
 - c. if small farmers are less likely to breach contracts than large farms.

When do value chains reduce poverty (given that they work)?

The poor can benefit from from modern value chains either by participating as self-employed (contract) farmer or by being employed as worker on larger farms or in processing activities.

1. Employment creation through value chains is more likely to reduce poverty ...
 - a. If the employment creation is complementary to small farms’ activities (i.e. employment is on large farms which do not take land from small farmers; or on processing and marketing activities in the chain);
 - b. If new employment requires relatively low-skills, creating opportunities for the very poorest.
2. Smallholder participation in the value chain results is more likely to lead to an increase in household income for smallholders if there is more surplus to be distributed or if, for a given level of surplus, farmers can claim a larger share of the surplus created by the value chain. This is more likely ...
 - a. If the value in the chain is larger;
 - b. If farmers’ have stronger bargaining power;
 - c. If there is significant demand for the produce and the farmer’s opportunity for side-selling the produce or for alternative uses of the value-chain-provided inputs/technology is larger (i.e. if the farmer’s hold up opportunities are larger);
 - d. If the buyer’s alternatives and hold-up opportunities are lower; which is more likely if:
 - There are more alternative buyers
 - There are fewer alternative suppliers.
 - The specificity of the product requirements are less (i.e. product’s valuation by other buyers is higher)
 - The transferred technology has long term effects.

8. Lessons

Several conclusions can be drawn from our analysis and empirical cases.

1. Value chain developments are often driven by a need for quality upgrading and/or guaranteed supplies. This was particularly clear after the economic reforms in Eastern Europe, where due to sudden and strong competitive forces and Western European FDI, the demand for high quality products was outpacing supply. Similar market developments are now occurring in Sub-Saharan Africa and other developing parts of the world, following the growth in high value exports, urbanization and a rise in domestic purchasing power.
2. Private contractual initiatives have emerged to overcome problems of supply and poor public institutions for governing exchange. Food retailing, trading and processing companies have problems obtaining quality supplies. The problems are worsened by the lack of public institutions necessary to support market-based transactions, such as for enforcing property rights and contracts.
3. Traders, agribusinesses and food companies contract with farms and provide inputs and assistance in return for guaranteed and quality supplies. Successful vertical contracting typically includes conditions for product delivery, prompt payments, and farm assistance programs for suppliers. Farm assistance can include input supply programs, investment assistance, trade credit, bank loan guarantees, extension and management advisory services, etc.
4. These technology transfer programs have been set up in complex environments. Successful programs create the right conditions for successful and self-enforcing contracting and are based on extensive knowledge of the sector and of local conditions. Moreover, these programs need to be flexible enough to adjust the contractual terms to changing circumstances – an often-occurring situation in developing and emerging economies.
5. Many institutional innovations for technology transfer use both a *pull* and *push* strategy. The push strategy consists of improving access to technology. Different modalities are often used for different types of technologies. Intermediate inputs are often provided through interlinked contracting or guaranteeing payment in a triangular system with technology providers. Longer term investments, such as machinery, often required a more sophisticated contract design, either involving a triangular guarantee structure with a financial institution that would provide the loan to the supplier to buy the equipment, or special purpose vehicles in which both the buyer and technology company collaborate. Knowledge, training and assistance is often directly provided by the downstream lead firm. One advantage of this direct contact is the possibility for the downstream lead firm to monitor the production process of the supplier – and thus to contribute to contract enforcement.
6. The pull strategy consists of providing better incentives for investments in technological upgrading. The most obvious way this was achieved was through price premiums for higher quality. Other strategies involved improving trust (e.g., by providing prompt payments) and relationship-specific investments by the

downstream lead firm to enhance the “private enforcement capital”. This made relationship-specific technology investments for suppliers less risky.

7. Access to finance by the initiator of the technology transfer program is essential. In all of the cases discussed, the firm that initiated the technology transfer innovation either received financial input through FDI or had significant financial sources. This is because interlinked contracting, pre-financing and guarantees require large upfront investments, or sufficient collateral. Here international organizations can potentially play an important role.
8. The effects of these programs can be very substantial as they can move the entire value chain towards a higher equilibrium, with impacts for all agents. Spillovers are not restricted to vertical interactions but can also be horizontal. Competing companies or firms that initiate a technology transfer program may introduce similar contractual arrangements, either to stay in business (as farms will otherwise shift to supplying other companies) or because it is profitable for them to do so once they observe the success of the innovations elsewhere – or both. Such type of contractual convergence may go beyond sectors in which the transfer program was initiated. Other sectors that compete for the same resources (e.g., land) might offer similar contracts as well – or financial institutions may standardize the approach for other farms.
9. Enforcement is an important problem. Enforcement is problematic where public enforcement institutions are absent. Trust is also often lacking as a base for business exchanges in many transition countries. Companies try to create “*self-enforcing contracts*” by designing the terms of the contracts such that nobody has an incentive to breach the contract. They also try to enforce contracts by “*interlinking markets*.” The enforcement of the credit transaction (loan and repayment) occurs through the output market. However, there are many cases where enforcement failed. Even in successful cases it took considerable fine-tuning of the contracts or adjustments as circumstances changed. Creating the right conditions for successful and self-enforcing contracting, requires extensive knowledge of the sector and of local conditions.
10. Contract forms reflect different constraints faced by farms. For example, an important contract motivation for farms in Africa is guaranteed access to markets and access to finance and inputs as input market constraints are important
11. Successful value chain development has important positive effects, both direct and indirect. The direct impact is on *increased output and productivity* of the processing company that initiates vertical contracting. Indirectly, contract support measures have positive effects on *farm productivity and product quality*. Measures with the greatest impact on yields were specialist storage (cooling equipment in dairy), veterinary support and physical inputs. Prompt payments, guaranteed prices, and market access also had large positive effects. *Quality* of output improved strongly in response to specific programs. Direct loans and loan guarantee programs stimulated farm *investments*. Programs which assist farms in accessing inputs (mainly feed) enhance investment indirectly by lowering input costs, or reducing transaction costs in accessing inputs, improving profitability.

12. Competition has complex effects on value chain development. It may spread equity and efficiency benefits, but also undermine enforcement. Competition is very important in supply chains for equity and efficiency. First, competition induces VC spillover effects across the sector as other processors are forced to introduce similar supplier assistance programs since suppliers may not want to deliver unless they get similar conditions. Second, competition prevents processing companies or input suppliers from exercising monopoly power in setting contract conditions with farms.
13. Foreign Direct Investment (FDI) drives successful contracting and supplier assistance programs. It is an initiator of change and institutional innovation. More sophisticated forms of vertical integration, with a greater emphasis on quality and standards, are often introduced by foreign companies because they tend to pay greater attention to quality standards. But we also find that spillover effects lead to convergence as domestic companies start copying the management practices of foreign affiliates.
14. Small farmer inclusiveness. First, transaction costs favor larger farms in supply chains. Second, small farms are more constrained for making necessary investments. Third, small farms typically require more assistance per unit of output. Therefore, companies *prefer* working with relatively fewer, larger, and more modern suppliers.
15. In reality, companies work with surprisingly large numbers of suppliers and of surprisingly small size. There are several reasons. Companies may have no choice if small farmers represent most of the supply base. Contract enforcement may be more problematic with larger farms. Farms' willingness to learn and attitude are more important than size in farm-processor relationships. Small farms may have cost advantages in labor intensive production activities. Processors may prefer a mix of suppliers. Cooperatives are more likely to work with small farms than corporate companies, either domestic or foreign.
16. The Smallholder Integration Paradox. Small poor farms may be best off (in the perspective of "supply chain driven development") if they are in an environment which is dominated by small poor farms. If small farmers must depend on farm assistance packages to make necessary upgrades, then it will be a problem if sufficient (quality) supplies are available because the processor is unlikely to come up with VC packages.
17. Poverty reduction through employment creation on larger farms. The public policy debate (explicitly or implicitly) frames the issue of vertical integration and small farms in terms of how public policy can prevent (small) farms from being exploited by large, sometimes multinational, agribusinesses in their contractual relationships. However, reality suggests a much more nuanced picture. First, while profits are their primary concern for all agribusinesses, this does not seem to lead to exploitation of farms. In cases where sufficient competition exists there is more evidence that producers benefit from VC than that they are exploited.

9. Implications for Government Policy and World Bank operations

Improve the enabling environment for value chain development

- *Recognize the relevance of value chain developments for rural development policy.* The most straightforward implication relates to recognizing the importance of value chain development as an engine for agricultural transformation and poverty reduction, and to the need for allowing this engine to work its best. A key policy to stimulate value chain development in the agricultural sector of developing and emerging countries is therefore to improve the enabling environment for companies and farmers to operate in. Enabling environments encompasses various macro-economic and macro-institutional elements.
- *Create the right conditions for investment.* A poor policy environment (e.g., high levels of corruption, high administrative burden to comply with government regulations, or ill-defined property rights) has a negative effect on investments in the agri-food industry and on vertical coordination programs. As such it constrains value chain development and its potential effects. Improving contract enforcement is another promising avenue for stimulating investment as it can reduce the risk of hold-ups. As it is generally either not possible or too costly to resolve disputes in courts, alternative dispute settlement institutions can play an important role. Other measures can include increasing transparency of contracts, supporting alternative dispute settling arrangements, training farmers in their rights/obligations as contractors etc.
- *Improve macro-economic stability.* Macro-economic stability is a key condition for financial markets to function properly. Instability may increase the risk of holdup, as unexpected changes in economic conditions might make it more attractive to default on the contract. Hence, macro-economic stability is not only necessary for the functioning of more traditional finance systems, but also for interlinked transactions as it reduces the risk of investments.

Enable smallholder inclusion in high value chains

- The exclusion of small suppliers in high value chains is mostly due to the high fixed transaction costs involved in dealing with numerous small-scale suppliers. Reducing (fixed) transaction costs is therefore key for inclusive value chains. This can be achieved in several ways.
- *Lower trading costs through improvements in rural infrastructure.* Inadequate rural infrastructure is a serious constraint on value chain development in general and is particularly important for integrating small producers in remote areas. Rural infrastructure includes main and feeder roads, but potentially also other types of marketing, transport, or storage infrastructure, such as public transport facilities, designated trading areas, ICT facilities, and warehousing.

- *Reduce the number of transactions by investing in intermediary institutions and farmer organizations.* Intermediary institutions and collective action on markets reduce the cost of exchange between farmers and other value chain actors.
- *Empowering farmers is needed* to strengthen their position in the chain for bargaining for better contract terms and vis-à-vis governments for better policies. Policies include stimulating farmers organization, investing in institutions for (independent) quality and safety control and certification, competition policy to ensure sufficient alternative market outlets and choice in inputs, public extension services, and market information services..

Rethinking the role of the government

- *Rethinking traditional public investments.* Traditional areas of public investment such as infrastructure, research and extension, market information systems, veterinary services and animal surveillance programs remain important, but could be better focused to take into account the developments (or lack thereof) taking place in value chains. Private sector value chain development might only be feasible for high-value market segments and for certain types of technology. One could therefore focus public research and extension on those firms or farms being excluded from private initiated programs, those low-value market segments for which private solutions are unlikely, and those technologies that are not provided by the private sector.
- *Value-chain development as part of a wider rural development strategy.* Countries with many small farmers are typically characterized by overemployment in agriculture. Integration of the farms in modern supply chains cannot solve all structural problems. Supply chain development models, even inclusive ones, can be only one part of a broader development strategy.
- *Look for new opportunities to become directly involved in value chain development through PPPs, value chain finance, long term NGO support to farmers, and the facilitation of multi-stakeholder platforms.* Many examples show this type of involvement can have clear and immediate effects on all value chain actors, and farmers in particular. Moreover, instead of taking the long route of improving the enabling environment, this approach presents a short-cut alternative to overcome high transaction costs and holdup problems.
- *Selective government involvement in markets carries a number of risks.* Government financing might not be “additional” to private sector initiatives, projects may not be sustainable beyond public funding, or projects might distort competition in markets leading to long term inefficiencies and farmers becoming dependent on a single buyer.
- *Inclusiveness does not guarantee poverty reduction.* Getting smallholders to participate in (high) value chains does not necessarily mean that those smallholders will benefit. The surplus created by value chain development might be claimed by other value chain actors. This reinforces the need for

interventions that improve the bargaining power of farmers or at least do no harm to it.

- *There is need for further research and more rigorous M&E systems.* The effectiveness of public support for value chain development has so far only been rarely evaluated rigorously. As still little is known about what type of intervention works best, for who, and in what type of context, further research on this topic, as well as, rigorous monitoring and evaluation of initiated programs is needed. As the number of public initiatives for value chain initiatives is large and growing, and because there are indications of highly significant effects these are research areas with a potentially high pay-off.

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Figures

Fig. 1. Food value chain with perfect markets

Fig. 2. Innovation 1: Contracting between farmer and processor/retailer

Fig. 3. Innovation 2: Contracting between farmer and input company

Fig. 4. Innovation 3: Triangular value chain structure

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