Section 5

Building Market Institutions
Farmer organizations and collective action institutions for improving market access and technology adoption in sub-Saharan Africa: Review of experiences and implications for policy

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Abstract
Farmer organizations, especially cooperatives, continue to play a fundamental role in coordinating agricultural production and marketing services in developing and developed countries. On the other hand, while many African governments supported the development of farmer organizations during the pre-adjustment era, these organizations failed to provide desired services to members and perished over time due to dependence on government support, which led to heavy political interference plus internal leadership and managerial problems. However, the hasty retreat of the state following adjustment and market liberalization reforms left an institutional void that the private sector has failed to bridge. This has left many smallholder farmers cut off from markets, causing significant backlashes and slowing efforts for sustainable productivity growth and poverty reduction. This study reviews the role that farmer organizations can play and the challenges they face in the post-adjustment era in improving access to markets and technologies for enhancing the productivity of smallholder agriculture in Sub-Saharan Africa.

Studies in Africa, Asia and Latin America have shown that despite their numerous challenges, farmer organizations can significantly enable their members to better access both factor and output markets that they could not otherwise do by acting individually. The review of specific studies in Nigeria and Kenya also points to the fact that belonging to a farmer group positively and significantly affected both the probability and intensity of adopting improved technologies. Similarly, the National Smallholder Farmers Association of Malawi (NASFAM) and other farmer organizations in Kenya provide evidence that farmer organizations can play a very important role in defending the interests of the farming community by giving voice to smallholder farmers and contributing to their empowerment and the inclusion of their interests in policy debates. The paper also outlines overlapping demands of social inclusiveness, empowerment and external competition as a result of globalization as some of the challenges facing farmer organizations in Sub-Saharan Africa. It concludes that, while recent experience is mixed, under conditions of democratic governance, as well as homogeneous and optimal group size, transparent and market-led farmer organizations can indeed enhance farmer access to markets, agricultural technologies and services that foster productivity growth and positive change. Donors and governments therefore have an important role in stimulating the emergence and development of economically viable and self-sustaining farmer organizations. Investment in complementary market infrastructure, capacity building, access to finance, and provision of enabling regulatory and legal frameworks for establishing better governance and accountability systems are critical for development of successful farmer organizations.

Introduction
Many countries in sub-Saharan Africa have adopted structural adjustment policies, attempted to liberalize their economies, and have developed poverty reduction strategies aimed at opening up new market-led opportunities for economic growth. The results have, however, been mixed (Winter-Nelson and Temu, 2002; Dorward and Kydd, 2004; Fafchamps, 2004). A large number of smallholder farmers continue to engage in semi-subsistence agriculture and are often unable to benefit from liberalized markets. Structural problems of poor infrastructure (Kydd and Dorward, 2004; Dorward et al., 2005) and weak institutions (World Bank, 2002) continue to characterize the subsector with high transaction costs, coordination failure and market imperfections. Moreover, partial implementation of market reforms, policy reversals and re-emergence of state marketing agencies and parastatals in agricultural markets have tended to mute the positive effects of liberalization (Jayne et al., 2002). Although opportunities afforded by liberalization have not been fully exploited, the expectation that the private sector would be able to fill the institutional vacuum left after the withdrawal of the state has not been realized. In many cases, the private sector has emerged only slowly, mainly in areas of high agricultural potential where commercial crops are grown, and tends to serve mainly large commercial farmers, leaving many smallholder farmers (especially in low-potential areas) exposed to high transaction costs and market failures. The demand and use of improved productivity enhancing inputs (improved seed and chemical fertilizers) declined substantially in many countries

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following liberalization because input costs increased or the
timely delivery of necessary inputs and essential credit facilities
could not be assured.

This has created a renewed interest in rural institutions and
farmer organizations that make use of collective action to
complement government and private-sector responses for
enhanced coordination in rural commodity markets. This is
because such organizations can enhance economies of scale and
facilitate access to input and output markets when individual
marketing of produce or buying of inputs does not make
economic sense due to small quantities, large spatial distances
and subsequently high marketing costs – characteristics
of most smallholder production in African agriculture.
Underdeveloped market infrastructure and lack of effective
farmer organizations that represent and mobilize the capabilities
of small and scattered producers in many rural areas create
disincentives for private-sector investment and agro-enterprise
development, even when the agricultural potential is high.
This leads to coordination failures that diminish investments
at different levels, prevent opportunities for correcting market
imperfections, and undermine economic development (Kydd and
Dorward, 2004).

Despite the increasing realization of the role they can play in
improving the performance of rural markets by mediating access
to input and output markets and agricultural technologies,
producer organizations tend to have ambitious objectives that
call for multiple functions and face complex challenges that
undermine their ability to provide desired services (Chirwa et al.,
2005; Shiferaw et al., 2009). While some producer organizations
have made considerable progress in improving their members’
incomes through better access to markets and other services,
many of them have not succeeded in attaining economic
viability. Many farmer organizations are undermined by attempts
to take on too many or overly ambitious objectives that range
from covering all kinds of commodities in diverse regions to
providing public goods (e.g., market information, agricultural
extension, advocacy) to their communities. Balancing between
social inclusiveness, cultures of reciprocity and non-market
exchanges, and economic efficiency to achieve competitiveness
in core market activities is a persistent challenge (World Bank,
2008; Bernard and Spielman, 2009). Their performance is also
undermined by inadequate market infrastructure and lack of
supportive market institutions, including well-defined policies

Continued government interference, as well as a tendency to
replace rather than complement other service providers and the
private sector, creates undesirable rigidities and inefficiency. In
other cases, non-targeted subsidies and dependence on external
funding or donor interference may undermine self-reliance,
accountability to members and sustainability (Chirwa et al.,
2005).

This paper is based on empirical work in Kenya supported
by extensive review of published literature in Africa, Asia
and Latin America on the experiences of various types of
producer organizations in providing marketing and other
agricultural services to smallholder farmers. The determinants
of membership to these producer organizations, the challenges
they face and the key design and policy issues that contribute
to their success in attaining efficiency and sustainability are also
reviewed and presented. The paper brings together experiences
from case studies in the post-adjustment era and provides
further insights for development policy on the functions and
effective roles that producer organizations can play to improve
smallholder access to markets, improved technologies and other
related services in sub-Saharan Africa. While presenting the
challenges to learn from experiences and avoid pitfalls, the key
interest is in defining policy issues and ways to harness unutilized
opportunities to encourage the growth and development of
producer organizations to support the Green Revolution in
Africa.

The rest of the paper is organized as follows. The next section
reviews market institutions and the emerging role of farmer
organizations in remediating market imperfections and improving
access to technologies, information and other services in
rural areas. The third section presents the experiences of
farmer organizations in terms of providing membership,
inclusiveness and distribution of benefits. Section four outlines
the performance of farmer organizations in improving access to
markets. The fifth section discusses experiences in improving
access to new technology and other services. The sixth presents
the key challenges facing farmer organizations, determinants of
performance and design principles that contribute to economic
viability and sustainability. We conclude in the last section with
a summary of key findings and policy challenges in unlocking the
full potential of producer organizations for improving markets
and increasing productivity of smallholder agriculture in support
of the Green Revolution in Africa.
Farmer organizations in imperfect rural markets

Institutions and market imperfection

According to North (1990), institutions constitute formal constraints and informal constraints that structure human interactions, and their enforcement characteristics. Similarly, the World Bank states that institutions are rules, including behavioral norms, by which agents interact to achieve desired outcomes (World Bank, 2002). Formal institutions include rules written into law by authorities and adopted by both public and private organizations operating under public law. Informal institutions, however, operate outside the formal legal system and reflect unwritten codes of social behavior. Both formal and informal institutions have their own external enforcement mechanisms, such as the judicial system and third-party arbitration. However, incentives created within existing institutional arrangements as mutually recognized systems of rewards and penalties often lead to internal enforcement of contracts. At initial stages of development, markets and trade rely more on the norm and network-based informal institutions that reduce transaction costs of collecting and processing information and risks associated with market transactions. As complexity of markets and trade increases, the number and range of partners involved in transactions expand significantly and informal institutions fail to absorb costs and risks to allow efficient market transactions, and thus the need for formal institutions. For example, inter-regional trade and participation in international markets require international rules and standards that facilitate market exchanges (World Bank, 2002).

Market failures are often caused by underlying policy and institutional failures that lead to asymmetric information, high transaction costs, and imperfectly specified property rights.¹ They tend to be more pronounced in areas with underdeveloped public goods and market infrastructure (e.g., road and communication networks), typical of many rural areas in Sub-Saharan Africa (Shiferaw et al., 2009). Without supportive market institutions, rural markets in these areas tend to be thin and imperfect, leading to high marketing and transaction costs. These costs undermine the exchange process (Kranton, 1996; Gabre-Madhin, 2001) leading to poorly integrated rural markets with few rural-urban linkages. Given such market arrangements, households respond by producing a limited range of goods and services for own consumption, especially when markets cannot be relied on to ensure household food security (de Janvry et al., 1991). Further, important market players fail to undertake profitable investments (due to absence of complementary investments) leading to coordination failures that hinder market performance (Dorward et al., 2005; Poulton et al., 2006). Associated shocks and vulnerabilities to production risk (i.e., weather, pests and sickness) and market risk also exacerbate market imperfections and lead to transaction failures (Dorward and Kydd, 2004).

How do institutions support market development? The important role of institutions is in reducing transaction costs related to inadequate information, infrastructure, incomplete definition and enforcement of property rights and barriers to entry (World Bank, 2002). This suggests that institutions (including formal rules and informal norms of collective action and their enforcement mechanisms) provide multiple functions to markets; they transmit information, mediate transactions, facilitate the transfer and enforcement of property rights and contracts, and manage the degree of competition. They can therefore be used to help remedy market imperfections and impediments in rural markets. Institutional innovations that reduce transaction costs and enhance market coordination – such as producer organizations and marketing groups that make use of collective action – can be instrumental in overcoming some of these problems.

Typology of farmer organizations and their functions

Farmer organizations² can be of several types, ranging from informal groups to formal cooperatives or collectively owned agro-enterprises. Depending on their anticipated functions and legal provisions in different countries, the organizational designs may take different forms – cooperatives, associations and societies. A farmer association is a non-profit organization designed to leverage collective action to access certain services (e.g., agricultural extension), enable exchange of information and provide representation and voice to members. On the other hand, farmer cooperatives can engage in commercial activities, including collective marketing of produce and buying of commercial inputs. The economic benefits are often distributed to members after covering costs according to the volume of transactions undertaken through collective action. Unlike other

¹Market failure is a subjective concept that is difficult to define more objectively. However, market failure is associated with conditions when markets fail to facilitate certain mutually beneficial transactions due to certain constraints related to information, exclusion, or inadequate provision of public goods. These underlying constraints often arise from policy failures or inadequate institutions.

²In this paper, we use farmer organizations interchangeably with producer organizations.
alternative agro-enterprises, this form of organization is often preferred by farmers as it allows exemption from taxes or qualifies the group to access other public or donor support.

Farmer organizations can be involved in several activities and may have several functions. This may include:

i) commodity specific commercial organizations (e.g., coffee, tea or cocoa cooperatives),

ii) advocacy organizations which aim to represent the interests of their members in various policy discussions (e.g., national farmer unions),

iii) development organizations that aim to improve local capacity and access to information and technology, and

iv) multipurpose organizations that engage in various economic, social development and empowerment activities, especially in areas where other providers are either unavailable or cannot offer such services at affordable costs. An example of the latter is the National Smallholder Farmers Association of Malawi (NASFAM), which has specialized subsidiaries that deal with commercial activities or the overall social and economic development of their members. Many farmer cooperatives, dealing with a diverse set of commodities and also engaging in social development and advocacy, fall into this last category.

While the effectiveness and efficiency of producer organizations in providing essential services often depends on the complexity of their mandate (Chirwa et al., 2005; Thompson et al., 2009), our main interest is in market-oriented farmer cooperatives and producer marketing groups that foster commercialization and adoption of modern inputs (varieties/hybrids and fertilizer) to improve productivity of smallholder production.

Farmer cooperatives play an important role in organizing production and marketing functions in developed countries. There are, for example, over 30,000 cooperatives representing over 9 million members within the European Union alone. These cooperatives account for 50% of the market share for delivery of inputs and 60% for agricultural produce (World Bank, 2008). On the other hand, farmer cooperatives were historically introduced in Sub-Saharan Africa during the colonial period for the purpose of promoting production of cash crops by peasant farmers (Hussi et al., 1993). After independence, many governments as well as donors continued promoting cooperatives and other rural organizations as a potential source of decentralized grassroots participation in agricultural credit, input and commodity markets (Lele and Christiansen, 1989; Hussi et al., 1993). However, their performances were mixed. In Kenya, for example, semi-autonomous agencies – such as the Kenya Tea Development Authority (KTDA) and the coffee and dairy cooperatives – were important to the growth of smallholder production, while some parastatals and cooperatives achieved mediocre records. The unsatisfactory performances are often attributed to technological problems and poor management (Wolf, 1986; Lele and Christiansen, 1989).

**Farmer organizations for improving markets**

Farmer organizations have the potential to mitigate the effects of imperfect markets by enabling contractual links to input and output markets and by promoting economic coordination in liberalized markets upon which market functions for smallholder farmers can be leveraged. In the output markets, collective marketing allows small-scale farmers to share the fixed costs of marketing, enhance their ability to negotiate for better prices, and improve their market power. It also allows contractual arrangements between large buyers and small producers, which would otherwise be very costly for such buyers to negotiate, monitor and enforce with many, dispersed individual farmers. Under conditions of asymmetric information, producer organizations can capitalize on local knowledge in screening participating farmers and apply peer-pressure to ensure compliance to commonly agreed contracts. In principle, organized small producers are better able to share information on market conditions, standardize production practices to comply with food-safety or fair-trade requirements, monitor the quality of their produce and supply homogenous products to meet market preferences, and absorb shocks through temporal and spatial arbitrage in agricultural markets.

As we show later, through coordination of marketing activities, cooperatives and Producer Marketing Groups (PMGs) could facilitate access to better markets, reduce marketing costs, and synchronize buying and selling practices to seasonal price conditions. PMGs can shorten marketing chains by linking producers more directly to the upper end of the marketing chain, as shown in Figure 1. Well-organized farmers would be able to bypass assemblers and brokers in rural markets and connect directly with urban wholesalers, high-value retailers and processors or exporters. This can be done through various contractual arrangements, including out-grower schemes or post-harvest bulk delivery (Shiferaw et al., 2008).
There are similar opportunities for leveraging farmer organizations for improving access to commercial inputs, rural finance, and other marketing services. In many rural areas, agricultural inputs (e.g., seeds and fertilizer) are either unavailable, unaffordable or smallholder farmers face high transaction costs. The high input costs for small quantities bought by individual farmers resulting from high transaction and transportation costs are likely to make investments in commercial inputs uneconomical to many smallholders. This undermines their ability to adopt new technologies, increase productivity, generate marketable surplus and facilitate commercialization of production, and locks many small producers into semi-subsistence agriculture. Although the evidence is mixed, farmer-marketing groups can facilitate input and output market access and service delivery, thus promoting commercial activities and technological change in agriculture (Shiferaw et al., 2008; Thompson et al., 2009). Realization of this potential will however depend on their ability to convey market information, coordinate production and marketing functions, define and enforce property rights and contracts, and more critically, mobilize smallholder farmers to participate in markets and enhance competitiveness of their agro-enterprises. In the following sections, we will review organizational and other challenges and the mixed evidence as to what extent farmer organizations have indeed improved market opportunities for small producers.
If farmer organizations are important for overcoming market impediments and improving farmer access to markets and agricultural technologies, one important question would be whether such collective action could actually evolve autonomously. Farmer marketing groups as an outcome of collective action are unlikely to emerge on their own (Johnson et al., 2002), especially for less commercialized products like staple crops (e.g., sorghum, millets, maize, cassava) where per unit economic returns are low and the private sector lacks incentives to foster cooperative efforts. The need for collective action depends on the type of market failure and transaction costs faced by producers, degree of spatial integration, and the time required to achieve desired outcomes. Controlling for conducive environment and political leaderships, White and Runge (1995) have shown that groups will emerge and survive where a “critical mass” of individuals have practical knowledge of the potential gains from collective action, but that in the short term emergence can be constrained by biophysical factors that affect the potential net gain, and socio-cultural factors that influence the cost of establishing the new institution. It follows therefore that both micro-level biophysical and socio-cultural factors, as well as national and regional policies, are important determinants of the emergence and viability of producer organizations and collective action. Additionally, an individual’s choice to participate in collective action will depend on his/her expectation of the net benefits and the behavior of other members.

While the need for farmer organizations and collective marketing increases with prevalence of incomplete markets in rural areas, actual collective action in marketing can only be expected to occur if expected benefits from lower transaction costs, better prices for inputs and outputs and/or empowerment and capacity enhancement outweigh the associated costs of complying with collective rules and norms. If the expected cooperation benefits are lower than the expected costs, households are unlikely to participate in group marketing activities. Successful collective action based on membership will, therefore, depend on the potential that group action will improve the members’ expected net benefit streams above and beyond what can be achieved without participation in collective efforts. In low-potential areas where spatially dispersed farm households produce small quantities for markets, individual net gain from collective marketing is likely to be low and unlikely to outweigh the costs of participation unless the size of the group is large enough to minimize unit costs. This observation points to the fundamental role of improving agricultural productivity and reducing production risks so as to create opportunities for market development (Barrett, 2008).

Despite the potential gains from collective action, individual cooperative behavior may not necessarily translate into collective action unless other potential beneficiaries agree to cooperate and do likewise. The presence and assurance of trust between and among individuals facilitates the potential for reciprocity and emergence of cooperative behavior (Runge, 1981; White and Runge, 1995). It therefore follows that interventions that enhance trust among members in a group, including laws of engagement and operational democracy, are likely to contribute to successful collective action. Nevertheless, the costs and benefits of participation in collective marketing are likely to differ across households depending on location, volume of production, asset endowment, education and managerial skills (Staal et al., 1997; Holloway and Ehui, 2002; Shiferaw et al., 2008). This implies that since the benefits of farmer marketing groups are unlikely to be equally distributed, some households may not find them useful unless some interventions are designed to enhance their participation – suggesting that individual participation in farmer organizations is an endogenous process that may vary across households. The key drivers of participation and the extent to which farmer organizations have achieved their goals in terms of delivery of marketing and other services will be discussed in the following sections.

Membership and inclusiveness

Producer organizations in many cases have overlapping mandates which extend from opening better market opportunities to their members to provision of other essential services (e.g., information, technologies, credit), empowerment of small producers, and contributing to larger poverty reduction efforts. While voluntary and self-driven participation of farmers will depend on several factors, including expected gains and costs, there are associated potential tradeoffs in terms of overall group performance and inclusiveness to reach out and share the benefits more widely. One question that is often raised in relation to farmer organizations is to what extent resource-poor farmers could actually participate in these organizations and benefit from collective action. This requires reviewing
the existing evidence on the determinants of participation of farmers in such groups and assessing whether the poor are included or excluded due to various entry barriers. The second element is to assess how inclusive the distribution of benefits has been, given that some benefits are non-exclusive or can be accessed through spillovers from participants to others. Before we present some evidence, it is important to highlight that performance and economic viability of farmer groups require setting certain restrictions on membership. While economies of scale increase with group size, this may also be associated with higher transaction costs in mobilizing widely dispersed farmers, and higher heterogeneity that may undermine group cohesion and reduce trust between members. Inclusiveness and expressed interest to tackle poverty may suggest wider and open membership, but the resource-poor may lack the ability to generate marketable surpluses or assets that may foster trust and creditworthiness. Nevertheless, many farmer organizations need to balance between economic viability, inclusiveness and other social goals.

In order to explore these questions, we use two case studies focusing on membership in PMGs in Kenya (Shiferaw et al., 2009) and farmer cooperatives in Ethiopia (Bernard and Spielman, 2009), both dealing with collective marketing of grain cereals and pulses, the typical less commercialized and bulkier commodities produced by small farmers in Africa. The Kenya study uses International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) data from 400 households, composed of 250 members in 10 PMGs and 150 non-members in the same villages, collected in semiarid eastern Kenya during 2005. Since households often belong to more than one group, the study used a bivariate probit model to identify the determinants of PMG membership. The bivariate specification was particularly used to test whether PMG membership is jointly determined with membership to closely related groups — agricultural production networks (APNs). Membership to APNs thus constituted the second equation in the bivariate specification. Participation in PMGs requires payment of a joining fee of about US$ 1 and an annual subscription fee that varies between US$ 2.5 to US$ 6 per member. These fees were determined by groups in such a way that they do not become a significant barrier for joining, but should be high enough to signify strong commitment to the principles of collective action.

Model variables included village fixed effects (location, market access, infrastructure), household asset endowments, household characteristics, human capital, and access to information. Dependency ratios, age and gender, male and female household workforce, family education, and main occupation of the household head captured household characteristics. Six variables were included to capture the effect of wealth and asset endowments: farm size, value of livestock, interaction between livestock and farm size, value of physical assets, ownership of means of transport, and oxen numbers (all in per capita terms). Access to information was captured through ownership of ICT (radio, mobile phones, and TV) and contact with NGO extension personnel. In the absence of effective public extension services, NGOs continue to play a vital role in the economic development process in the semiarid areas. In this case, the Catholic Relief Services (CRS) was instrumental in farmer mobilization and sensitization for establishing PMGs while ICRISAT is the source of improved germplasm and crop cultivars. Location effects are captured through distance to local and main markets and average rainfall conditions for the PMG villages. For comparison, we also report the univariate probit model results (Table 1) but will only discuss here effects on participation in group marketing activities (PMG membership).

The bivariate model results showed that the residuals of the two network membership equations are not independent (P > 0.034). The variables with significant effects on membership include female workforce in the household (P = 0.018), ownership of ICT (P = 0.067), log of per capita farm size (P = 0.072), the asset interaction term (farm size*livestock) (P = 0.042), household education (P = 0.014), household occupation (P = 0.078), and access to information (P = 0.095). The distance and location effects were not significant. The important variables for our purpose here are the household assets (wealth indicators). The results show that membership is likely to increase with livestock wealth, but decrease with size of farmland per capita. This indicates that households with larger farm sizes alone are less likely to participate in collective marketing. For a given level of livestock wealth, households with lower per capita farmland have a higher probability of participation. However, households with more land and livestock assets together are more likely to become members. Although the effect of livestock wealth alone was not significant, this potentially opposing effect may result

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1About 11% of the non-PMG and 20% of the PMG member farmers belonged to agricultural production networks (APNs). These groups are involved in agricultural production and some marketing activities, including sharing of labor and information. The membership of sample farmers to other local groups included 54% to natural resource management, 75% to saving groups (merry-go-round) and 50% to other social networks.
Table 1: Bivariate and univariate probit determinants of PMG membership.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Bivariate probit PMG</th>
<th>Bivariate probit APN</th>
<th>Univariate probit PMG membership</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Coefficient</td>
<td>Coefficient</td>
<td>Coefficient</td>
</tr>
<tr>
<td>Dist to village market (km)</td>
<td>-0.083 (0.061)</td>
<td>-0.090 (0.070)</td>
<td>-0.082 (0.061)</td>
</tr>
<tr>
<td>Dist to nearest main market (km)</td>
<td>0.006 (0.014)</td>
<td>-0.023 (0.018)</td>
<td>0.006 (0.013)</td>
</tr>
<tr>
<td>HH age (Years)</td>
<td>-0.006 (0.006)</td>
<td>0.003 (0.007)</td>
<td>-0.006 (0.006)</td>
</tr>
<tr>
<td>HH gender (1 = male, 0 = female)</td>
<td>0.182 (0.178)</td>
<td>-0.111 (0.207)</td>
<td>0.179</td>
</tr>
<tr>
<td>Male workforce</td>
<td>0.024 (0.082)</td>
<td>-0.104 (0.091)</td>
<td>0.026 (0.083)</td>
</tr>
<tr>
<td>Female workforce</td>
<td>0.206** (0.087)</td>
<td>0.056 (0.103)</td>
<td>0.204** (0.087)</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>0.029 (0.044)</td>
<td>0.094** (0.047)</td>
<td>0.028 (0.044)</td>
</tr>
<tr>
<td>HH owns ox-cart (1 = yes, 0 = otherwise)</td>
<td>0.138 (0.178)</td>
<td>0.094 (0.198)</td>
<td>0.131 (0.177)</td>
</tr>
<tr>
<td>HH located in average rainy area (1 = yes, 0 = otherwise)</td>
<td>-0.120 (0.200)</td>
<td>0.041 (0.219)</td>
<td>-0.127 (0.200)</td>
</tr>
<tr>
<td>HH located in dry area (1 = yes, 0 = otherwise)</td>
<td>-0.155 (0.173)</td>
<td>0.396** (0.200)</td>
<td>-0.158 (0.173)</td>
</tr>
<tr>
<td>Log of per capita Livestock asset (Ksh)</td>
<td>0.842 (0.533)</td>
<td>-0.507 (0.647)</td>
<td>0.837 (0.531)</td>
</tr>
<tr>
<td>Log of per capita physical asset (Ksh)</td>
<td>0.916 (0.703)</td>
<td>-0.346 (0.854)</td>
<td>0.911 (0.699)</td>
</tr>
<tr>
<td>Log per capita farm size (acres)</td>
<td>-2.093* (1.162)</td>
<td>-2.408* (1.330)</td>
<td>-2.114* (1.169)</td>
</tr>
<tr>
<td>Log of per capita Livestock* Log per capita farm size</td>
<td>0.766** (0.376)</td>
<td>0.866** (0.397)</td>
<td>0.772** (0.381)</td>
</tr>
<tr>
<td>Per capita oxen numbers</td>
<td>-0.389 (0.316)</td>
<td>-0.922* (0.506)</td>
<td>-0.388 (0.321)</td>
</tr>
<tr>
<td>Per capita family education stock</td>
<td>0.097** (0.040)</td>
<td>0.069 (0.045)</td>
<td>0.099** (0.040)</td>
</tr>
<tr>
<td>Main occupation (Farming = 1, 0 = otherwise)</td>
<td>0.301* (0.171)</td>
<td>0.217 (0.202)</td>
<td>0.299* (0.171)</td>
</tr>
<tr>
<td>HH owns ICT (1 = yes, 0 = otherwise)</td>
<td>-0.347* (0.190)</td>
<td>-0.102 (0.224)</td>
<td>-0.352* (0.192)</td>
</tr>
<tr>
<td>Average contact with NGOs (1 = yes, 0 = otherwise)</td>
<td>-0.179 (0.164)</td>
<td>0.243 (0.203)</td>
<td>-0.176 (0.164)</td>
</tr>
<tr>
<td>No contact with NGO (1 = yes, 0 = otherwise)</td>
<td>-0.351* (0.210)</td>
<td>0.490** (0.240)</td>
<td>-0.354* (0.210)</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.744 (1.845)</td>
<td>-0.989 (2.236)</td>
<td>-2.726 (1.832)</td>
</tr>
<tr>
<td>/athrho</td>
<td>0.229** (0.108)</td>
<td></td>
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</tr>
<tr>
<td>Wald χ2[df]</td>
<td>[46] 98.20: Prob &gt; χ2 = 0.000</td>
<td>[23] 39.44: P &gt; χ2 = 0.0178</td>
<td></td>
</tr>
<tr>
<td>Log pseudo-likelihood</td>
<td>-395.854</td>
<td></td>
<td>-243.069</td>
</tr>
<tr>
<td>Wald test of ρ = 0</td>
<td>χ2 [1] = 4.501</td>
<td>Prob &gt; χ2 =0.034</td>
<td></td>
</tr>
</tbody>
</table>

Note: Robust standard errors are in parentheses; [df] are degrees of freedom.
when higher livestock wealth is associated with smaller cropland, which reduces the marketed surplus and increases the gains from collective marketing. The results indicate that it is primarily those farmers with small landholdings (but not necessarily resource-poor) who participate in collective marketing. These are households that produce small surpluses and probably face higher transaction costs in marketing their produce. We also found that education and farm-orientation increase the likelihood of PMG membership. Along with better education, NGO sensitization and information flow seem to be good instruments for facilitating participation in group marketing.

The Ethiopia study (Bernard and Spielman, 2009) also provides several useful insights on participation and inclusiveness in terms of distribution of benefits to members and others. The data come from two sources: a 2005 national survey of smallholders (7,186 households) to study commercialization and a survey of 205 cooperatives in 2006 conducted by the Ethiopian Development Research Institute (EDRI), in collaboration with the International Food Policy Research Institute (IFPRI). This study is particularly relevant since rural marketing cooperatives are being promoted in Ethiopia as a key strategy for accelerating commercialization of smallholder agriculture. While the level of farmer participation in marketing through cooperatives varies across regional states, about 39% of the households at the national level have access to a cooperative in their village (Bernard and Spielman, 2009). In terms of the internal rules for joining, all the surveyed cooperatives indicated that a potential member should pass the screening criteria. But the relevance of the screening criteria varied across cooperative – about 57% required buying a cooperative share (about US$ 10 per share) and payment of annual fee (about US$ 1), 87% required living in the same peasant association, 66% imposed lower and upper age limits, and about 8% required ownership of certain assets. These fees are slightly higher than those for PMGs in Kenya and may have the effect of excluding some from membership. Many farmer organizations in Africa set such criteria for screening members. For example, NASFAM imposes stringent screening criteria to determine its member farmer associations, and they are also required to sign a service contract. The results from the Ethiopia study indicate that membership in cooperatives is positively determined by family size, education, and household productive assets (land and oxen used in crop production).

The negative correlates included gender indicator (female = 1) and the square of land and oxen assets, indicating some kind of diminishing returns as farm size and oxen wealth increase. This seems to provide evidence for a “middle class” effect for participation in cooperatives, which suggests lower participation for the resource-poor on the bottom end and the wealthiest households on the top end of the selected wealth indicators (Bernard and Spielman, 2009).

In addition to membership, farmer organizations may achieve inclusiveness through generating non-exclusive or partially exclusive benefits for the community and non-members. For some activities where benefits from economies of scale are high, the cooperatives seem to open activities to both members and non-members. An example of this is provision of fertilizer and other inputs. However, where the associated risks from unrestricted access and service provision are high or when available supplies are limited, the service is often provided only to members (e.g., provision of credit or marketing of grain). Non-members access credit from cooperatives in less than 20% of all cases and only in 2.5% of the cases do cooperatives buy produce from non-members. However, the existence of a cooperative does seem to generate some non-excludable spillover benefits to non-members. This may include provision of non-rival or non-excludable price and agronomic information or increased market competition with private traders and other buyers, which tend to increase producer prices for all farmers (Bernard and Spielman, 2009).

Experiences in improving markets

While farmer organizations in Africa are increasingly being involved in marketing functions, much of the experience and recorded success in the past is related to cash crops (e.g., coffee and tea in Kenya and tobacco and tea in Malawi) and high-value commodities – horticultural export crops in Kenya (Stockbridge et al., 2003; Thompson et al., 2009) as well as urban and peri-urban dairying (Staal et al., 1997; Holloway and Ehui, 2002). In recent years a few more studies have examined the role of producer groups in improving markets for a range of other commodities. In this section we assess the potential effect of farmer organizations in overcoming market impediments to create better opportunities for small producers. We draw from published literature in the developing regions (mainly in Africa).
to assess whether producer organizations increase market benefits in terms of either higher or more stable prices, higher product demand or greater market power for small producers.

The evidence shows that farmer organizations or marketing groups significantly enable their members to better access both factor and output markets that, acting individually, they could not otherwise do. Recent studies in Africa, Asia and Latin America have documented the role that farmer groups have played in enabling smallholders’ access to high-value markets (Wollni and Zeller, 2007; Shiferaw et al., 2008; Bernard et al., 2008; Bernard and Spielman, 2009; Hellin et al., 2009; Narrod et al., 2009; Kaganzi et al., 2009). In their case studies of farmer organizations, collective action and market access in Central America, Hellin et al. (2009) show that benefits from farmer organization are more evident for high-value crops like vegetables, where there are better opportunities to improve producer prices through collective action. They agree that, unlike the traditional vegetable markets where small producers are linked to regional and national markets through a network of informal traders, modern vegetable markets in high-value outlets in Honduras and El Salvador consist of diverse farmer organizations linked to specialized wholesalers or directly to supermarkets, restaurants and hotels. The quality of the product and the reliability of supply are key features that need to be met in these high-value markets. They show that while collective action was not suitable for some output markets (e.g., maize in Mexico where government fixes producer prices and farmer groups can neither influence prices nor market participation), it still played an important role in ensuring access to input markets at prices affordable to farmers growing maize and other crops. For example, they report that one of the communities interviewed in Mexico successfully managed to purchase improved hybrid maize seed from a single distributor at 860 Pesos (US$ 80), down from the normal price of 940 Pesos per bag (US$ 88) if it was bought individually. Input suppliers may also provide additional concessions when they deal with large consignments; in this case the distributor even provided free transport to the community (Hellin et al., 2009).

Similarly, a study in Uganda highlights the role of producer marketing groups in opening market opportunities for potato producers linked to the food processing industry (Kaganzi et al., 2009). The Nyabyumba Farmers Group (NFG), located about 450 km away from the capital city, Kampala, managed to change its production and marketing strategies to supply a modern fast-food restaurant in Kampala (Nandos Restaurant) with high quality potatoes. Though no formal contract was entered, a purchase agreement was made between NFG and Nandos specifying the volume and the frequency of supply, quality criteria and terms of payment. Despite the initial challenges of meeting the stringent quality requirements, the farmer group gradually managed to achieve the high quality standards, bringing down the amount of potatoes rejected by Nandos from about 80% initially to consistently less than 10%. In order to meet the high quality requirements, the farmer group expanded its operations and took on both seed and potato production and marketing. This evidence supports how small farmers even in remote locations can successfully leverage institutions and shift from local markets to supplying a distant formal buyer in high-value markets. Similar evidence exists for the case of fruits and vegetables in Kenya and India (Narrod et al., 2009). The high-value markets (e.g., export markets and some domestic supermarkets) for fruits and vegetables impose standards relating to pesticide residues, field and pack house operations and traceability. Organized producer groups monitoring food safety and quality standards often meet these stringent requirements and thereby become attractive to buyers (Siambi et al., 2008; Narrod et al., 2009). The high risks associated with these markets often preclude individual small producers from tapping the opportunities. Losses due to inability to meet these food safety and phytosanitary standards are enormous. Some estimates indicate that imposing tough minimum acceptable aflatoxin levels in groundnut has resulted in annual losses of over US$ 670 million in export revenues for African farmers (Otsuki et al., 2001).

The key lesson from these studies is that the existence of a high-value market that relies on consistent supply of high quality and differentiated products creates incentive to establish connections with the farmer group and contributes to the relative success of producer organizations in exploiting market opportunities. This is not always the case in markets with undifferentiated products such as food staples. Studies from Kenya and Ethiopia provide some evidence on the challenges that farmer organizations face in improving markets for grain legumes and staple cereals (Shiferaw et al., 2008; Bernard et al., 2008; Bernard and Spielman, 2009).
Using data from cross-sectional household surveys (referred to earlier) in semiarid eastern Kenya, Shiferaw et al. (2008) test whether farmer groups (PMGs) indeed pay significantly higher prices for marketed grain than other buyers. In order to test this hypothesis, a regression model was estimated to identify the determinants of actual prices received by farmers. The main model variables included distance to the selling market, type of buyer, type grain traded, season, grain quality and household characteristics of the farmer. The model was significant (p < 0.001) and explained about 61% of the variation (R² = 0.612). The results show that producer prices are significantly determined by the distance to the point of transaction, the type of crop sold, location (district), buyer type (particularly consumers, PMGs and schools) and the season the grain is sold (Table 2). When we look at the different marketing channels, consumers, PMGs and

Table 2: Determinants of grain prices received by farmers in different rural markets.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Descriptive statistics (mean)</th>
<th>Estimated Coefficient</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amount sold (kg)</td>
<td>324.95</td>
<td>-0.001(-0.99)</td>
</tr>
<tr>
<td>Amount sold squared (1000 kg)</td>
<td>439</td>
<td>0.000(0.16)</td>
</tr>
<tr>
<td>Distance to selling point (km)</td>
<td>4.6</td>
<td>0.023(1.98)**</td>
</tr>
<tr>
<td>Crop dummies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Beans</td>
<td>0.06</td>
<td>15.151(15.04)***</td>
</tr>
<tr>
<td>Pigeon pea</td>
<td>0.08</td>
<td>11.250(12.1)***</td>
</tr>
<tr>
<td>Chickpea</td>
<td>0.03</td>
<td>13.529(9.35)***</td>
</tr>
<tr>
<td>Greengram</td>
<td>0.27</td>
<td>12.342(19.65)***</td>
</tr>
<tr>
<td>Cowpea</td>
<td>0.03</td>
<td>4.107(3.04)***</td>
</tr>
<tr>
<td>Cotton</td>
<td>0.04</td>
<td>7.791(4.81)***</td>
</tr>
<tr>
<td>Vegetables</td>
<td>0.04</td>
<td>7.492(5.59)***</td>
</tr>
<tr>
<td>Quality (1= if fair average quality)</td>
<td>0.92</td>
<td>0.186(0.22)</td>
</tr>
<tr>
<td>District (1= Makueni)</td>
<td>0.16</td>
<td>-2.254(-3.07)***</td>
</tr>
<tr>
<td>Buyer dummies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Consumer</td>
<td>0.05</td>
<td>6.7476.02)***</td>
</tr>
<tr>
<td>Produce Marketing Group (PMG)</td>
<td>0.04</td>
<td>5.950(5.05)***</td>
</tr>
<tr>
<td>Rural wholesaler</td>
<td>0.45</td>
<td>-0.609(-1.19)</td>
</tr>
<tr>
<td>Urban trader</td>
<td>0.02</td>
<td>0.959(0.51)</td>
</tr>
<tr>
<td>Cotton ginnery</td>
<td>0.02</td>
<td>1.074(0.52)</td>
</tr>
<tr>
<td>School buyer</td>
<td>0.03</td>
<td>3.630(2.72)***</td>
</tr>
<tr>
<td>Season dummies:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Harvest season</td>
<td>0.71</td>
<td>-1.448(-1.91)***</td>
</tr>
<tr>
<td>2 to 3 months after harvest</td>
<td>0.19</td>
<td>-1.133(-1.29)</td>
</tr>
<tr>
<td>Owns Information and Communication Technology (yes = 1)</td>
<td>0.82</td>
<td>0.157(0.26)</td>
</tr>
<tr>
<td>Constant</td>
<td>-</td>
<td>14.069 (10.41)***</td>
</tr>
<tr>
<td>N</td>
<td></td>
<td>624</td>
</tr>
<tr>
<td>F (21, 602)</td>
<td></td>
<td>0.60</td>
</tr>
<tr>
<td>Adj R²</td>
<td></td>
<td>45.06</td>
</tr>
</tbody>
</table>

Notes: Values in parentheses are robust standard errors

***, ** and * indicate significant at 0.01, 0.05 and 0.10 probability levels, respectively.

* Reference variables: crop price = maize; quality = above average; district = Mbeere district; buyer = broker/assembler; season = 4-5 months after harvest.
schools respectively paid about Ksh 7, Ksh 6, and about Ksh 4 per kg of grain over and above the prices paid by the traditional buyers – brokers and assemblers (P < 0.01). This shows that PMGs can be attractive market outlets for small producers. About 70% of the grain is sold immediately after harvest, but farmers selling at this time (Season 1) would lose about Ksh 1.5/kg compared to those who can afford to delay selling for 4-5 months (reference season) after harvest (P < 0.051). Farmers can even benefit from higher prices by delaying sales for 2-3 months after harvest (Season 2) as prices for this period are not really significantly lower than prices 4-5 months after harvest. This shows that PMGs could exploit seasonal price differentials through temporal arbitrage involving bulking and storage. A further simulation analysis using these econometric results showed that prices paid by the PMGs to the member farmers – after having covered operational costs – are about 22 to 24% higher than the prices paid by brokers and assemblers (Table 3). However, this price gain comes at a cost of delayed payments to grain sellers (on average for 5 weeks) (Figure 2). In contrast, other competing buyers paid on delivery or shortly thereafter. This explains why many cash-constrained farmers opt to sell through other channels, even at lower prices.

On the other hand in Ethiopia, Bernard et al. (2008) employ a treatment effects (propensity score matching) model to measure the average difference between the price received by cooperative members and that received by their matching non-member comparator groups. They use a matched sub-sample of 2,532 households from the 2005 national smallholder commercialization survey of 7,186 households (referred to earlier). The results showed that cooperative members in Ethiopia received between 7.2 and 8.9% higher prices for their cereal produce than their non-member counterparts. This effect was statistically significant and robust across both the Kernel based matching method and the nearest neighbor matching method. This finding on the effect of cooperatives on producer prices is corroborated by the Costa Rica study on coffee marketing, which showed that marketing through cooperatives increases the average price obtained by US$ 0.05/lb (Wollni and Zeller, 2007). This study also showed that cooperative membership increased farmer participation in specialty coffee channels which by itself increased prices by US$ 0.09/lb.

Farmer groups also seem to play a role in market development for underutilized crops. A study in southern India found that farmer groups were instrumental in creating incentives for production and consumption of minor millets (e.g., finger millet), which initially faced weak demand due mainly to consumer ignorance of useful product attributes and poor public and scientific knowledge about the crops (Gruere et al., 2009). The study highlighted the role of collective action through producer groups as a necessary but not sufficient condition for successful commercialization and sustainable use of underutilized crops.

### Experiences in access to technology and other services

#### Technology diffusion

Access to new agricultural technologies is critical for economic viability and market competitiveness of smallholder production. Many farmer organizations therefore include as one of their missions to improve farmer access to agricultural technologies (e.g., improved varieties and hybrids) and know-how on productivity enhancing and/or risk-reducing management practices, including post-harvest grain handling and storage. New models of agricultural extension require participation of small farmers in technology choice decisions and producer

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**Table 3: The effect of collective marketing on pigeon pea prices in eastern Kenya.**

<table>
<thead>
<tr>
<th>Buyer</th>
<th>Season</th>
<th>Point of sale</th>
<th>Price (Ksh/kg)</th>
<th>PMG price advantage (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PMG</td>
<td>Immediately after harvest</td>
<td>Farm gate</td>
<td>29.81</td>
<td>24.00</td>
</tr>
<tr>
<td>Brokers / assemblers</td>
<td></td>
<td></td>
<td>24.04</td>
<td></td>
</tr>
<tr>
<td>PMG</td>
<td></td>
<td>5 km</td>
<td>29.93</td>
<td>23.88</td>
</tr>
<tr>
<td>Brokers / assemblers</td>
<td></td>
<td></td>
<td>24.16</td>
<td></td>
</tr>
<tr>
<td>PMG</td>
<td>4–5 months after harvest</td>
<td>Farm gate</td>
<td>31.16</td>
<td>22.72</td>
</tr>
<tr>
<td>Brokers / assemblers</td>
<td></td>
<td></td>
<td>25.39</td>
<td></td>
</tr>
<tr>
<td>PMG</td>
<td></td>
<td>5 km</td>
<td>31.29</td>
<td>22.62</td>
</tr>
<tr>
<td>Brokers / assemblers</td>
<td></td>
<td></td>
<td>25.52</td>
<td></td>
</tr>
</tbody>
</table>
organizations play an important role in linking research and extension services with farmers. Farmer organizations are increasingly involved in public and private sector efforts for technology testing, validation and diffusion. For example, in its effort to promote farming as a business, NASFAM facilitates farmer access to new technologies, including variety choice and best-bet agronomic practices and post-harvest management. As the capacity of farmer organizations increases, they tend to hire their own professional extension personnel to build in-house capacity for provision of agricultural extension services to their members. Despite the obvious role that farmer organizations play in catalyzing and facilitating farmer access to new technologies and transferring know-how, very few studies have actually examined this role systematically in Africa. The evidence described below is based on technology adoption studies conducted in Nigeria (Kristjanson et al., 2005) and Kenya (Shiferaw et al., 2009).

Using survey data from 462 households in northern Nigeria to assess the adoption of improved dual-purpose cowpea (IDPC) varieties, Kristjanson et al. (2005) provide empirical evidence that belonging to a farmer group has a positive effect on adoption of new varieties. In a model that controls for several household assets, demographic, farm and village characteristics, they find a significant and positive effect of participation in farmer groups on the probability and intensity of adopting IDPC varieties in the dry savannas of Nigeria. More specifically, the results showed that belonging to a farmer group increased probability of adopting IDPC varieties by about 14.2% and increased the intensity of adoption (ratio of IDPC area in total cowpea area) by about 0.31, indicating a stronger impact of participation in producer groups on facilitating technology adoption.

The Kenya study uses data from semiarid eastern Kenya to test the potential impact of PMGs in facilitating the access of smallholder farmers to improved seeds and agricultural inputs. The PMGs in eastern Kenya have been involved in local production and marketing of improved seeds of dryland crops. Selected farmer members trained in quality seed production methods produce new varieties with the support of some NGOs. The groups then market the improved seeds to members at affordable prices, while in some cases non-members could also buy seeds from the PMG outlets at relatively higher prices. In order to test this effect, Shiferaw et al. (2009) estimated a probit model where membership (an endogenous variable) is instrumented using predicted values from a bivariate model (discussed earlier). Separate regressions were estimated for maize, pigeon pea and green gram for which a significant share of farmers indicated planting new varieties (Table 4). Group membership does not seem to have any observable significant effect on adoption of improved maize varieties (hence results not shown in Table 4). This may indicate that both members and non-members have equal levels of access to maize seed — a focus of public and other extension efforts in many parts of Kenya. On the other hand, participation in PMGs had a significant positive effect on the uptake of dryland legume crops (pigeon pea and green gram) (P < 0.001). These are important cash and food crops for many smallholders in the drier areas, but are not directly targeted through formal extension systems or seed companies. Adoption of improved varieties for both crops is significantly higher in the drier zones where these crops are more important. In addition, farmers with more dependent family members seem to have lower likelihoods for legume adoption, perhaps because food security concerns push these households to focus on staple cereals. This study showed that, once PMGs enable and catalyze access to new technologies, varieties would gradually spread through farmer-to-farmer exchange of information and new seeds. The role of community organizations and informal seed systems in accelerating technology diffusion is particularly evident for open-pollinated varieties and largely self-pollinated legumes where out-crossing is limited and genetic purity is maintained over 3-4 production seasons. It seems that the role of producer organizations in facilitating access to new varieties is higher for such crops where private seed companies may lack incentives due to exclusion problems.

Advocacy, voice and empowerment
In addition to the economic benefits that they generate through agro-enterprise development, farmer organizations defend the interests of the farming community, give voice to small farmers, and contribute to empowerment and inclusion of the poor in policy debates. Historically, specialized producer organizations have emerged to protect the interests of farmers growing commercial crops. In the recent past, several apex advocacy organizations (such as national producer unions) have emerged in many African countries, e.g., NASFAM in Malawi and Kenya National Federation of Agricultural Producers (Kenfap) in Kenya. NASFAM is well recognized by various stakeholders and...
frequently invited to policy roundtables to represent smallholder farmers. It is widely regarded as the voice of small farmers in Malawi. It has been quite successful in lobbying on behalf of smallholder farmers (e.g., attracting funding from different donors), offering a voice for over 100,000 small-scale member farmers who would otherwise have remained marginalized. A recent achievement of NASFAM is its successful campaign to have the 7% tobacco withholding tax removed from tobacco sold through affiliated smallholder groups. Likewise, Kenfap has been instrumental in lobbying and negotiating on behalf of the small farmers in Kenya. For example, in 2008 Kenfap convinced farmers not to sell maize at the government recommended price of Ksh 1,950 per 90 kg bag, arguing that the price was far below the production cost of Ksh 2,329. After an extended negotiation, the government finally recommended a price of Ksh 2,300. Kenfap has also lobbied frequently for the government to intervene and reduce the cost of farm inputs (http://www.kenfap.org/). Similarly, Kenya Potato Farmers Association (KPFA), a recently registered association, has successfully lobbied for stipulation in Legal Notice No. 113 the maximum size of bags in which potatoes can be sold. This required all local authorities to enforce the maximum standard size (110 kg) bag for potatoes. Despite vigorous opposition from brokers and traders, it continues to lobby for a “fair deal” to protect the interests of small potato farmers.

Producer organizations are now better represented in international platforms where global issues affecting agriculture in Africa and other developing regions are discussed. National farmer organizations are coming together at the regional, continental and global levels to establish solidarity across borders. For example, in West Africa, national federations of producer organizations have set up the Network of Producer Organizations of West Africa (ROPA). The International Federation of Agricultural Producers (IFAP) also recently opened its membership to producer organizations from developing

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pigeon pea</th>
<th>Green gram</th>
</tr>
</thead>
<tbody>
<tr>
<td>Predicted membership</td>
<td>5.49(1.46)***</td>
<td>2.69(1.03)***</td>
</tr>
<tr>
<td>Age of head</td>
<td>0.012(0.01)*</td>
<td>0.002(0.01)</td>
</tr>
<tr>
<td>Head is male</td>
<td>-0.255(0.21)</td>
<td>0.305(0.25)</td>
</tr>
<tr>
<td>Male workforce</td>
<td>-0.098(0.09)</td>
<td>-0.039(0.10)</td>
</tr>
<tr>
<td>Female workforce</td>
<td>-0.405(0.14)***</td>
<td>-0.105(0.12)</td>
</tr>
<tr>
<td>Dependency ratio</td>
<td>-0.037(0.05)</td>
<td>-0.162(0.07)**</td>
</tr>
<tr>
<td>Owns radio, phone or TV</td>
<td>0.303(0.27)</td>
<td>0.553(0.25)**</td>
</tr>
<tr>
<td>Owns ox-drawn cart</td>
<td>-0.247(0.19)</td>
<td>0.281(0.21)</td>
</tr>
<tr>
<td>Lives in medium rainfall area</td>
<td>0.673(0.21)***</td>
<td></td>
</tr>
<tr>
<td>Lives in dry area</td>
<td>0.807(0.17)***</td>
<td>-0.167(0.18)</td>
</tr>
<tr>
<td>Log of per capita land</td>
<td>1.316(1.63)</td>
<td>1.287(1.43)</td>
</tr>
<tr>
<td>Log of per capita livestock</td>
<td>-0.485(0.20)**</td>
<td>-0.163(0.20)</td>
</tr>
<tr>
<td>Log of per capita physical assets</td>
<td>0.277(0.16)</td>
<td>-0.119(0.17)</td>
</tr>
<tr>
<td>Log per capital land * log per capita livestock</td>
<td>-0.482(0.49)</td>
<td>-0.351(0.44)</td>
</tr>
<tr>
<td>Per capital oxen numbers</td>
<td>0.356(0.49)</td>
<td>1.224(0.40)***</td>
</tr>
<tr>
<td>Per capita education</td>
<td>-0.081(0.06)</td>
<td>-0.131(0.06)**</td>
</tr>
<tr>
<td>Farming as main occupation (yes = 1)</td>
<td>-0.647(0.23)***</td>
<td>-0.104(0.24)</td>
</tr>
<tr>
<td>Average contact with NGO (yes = 1)</td>
<td>1.295(0.27)***</td>
<td>0.122(0.33)</td>
</tr>
<tr>
<td>No contact with NGOs (yes = 1)</td>
<td>1.027(0.35)***</td>
<td></td>
</tr>
<tr>
<td>Has extension contact (yes = 1)</td>
<td>-0.048(0.15)</td>
<td>-0.514(0.16)***</td>
</tr>
<tr>
<td>Predicted error</td>
<td>-1.226(1.47)</td>
<td>0.423(1.58)</td>
</tr>
<tr>
<td>Constant</td>
<td>-2.687(0.90)***</td>
<td>-1.001(1.04)</td>
</tr>
</tbody>
</table>

Notes: Values in parentheses are robust standard errors

***, ** and * indicate significant at 0.01, 0.05 and 0.10 probability levels, respectively.
countries. This has enabled producer organizations to participate in consultations with local, national and international bodies (World Bank, 2008).

Challenges and determinants of performance

Challenges

Despite the emerging evidence on the positive role of producer organizations in improving markets and supporting farmer access to information and technologies, success is not necessarily assured for today’s farmer organizations in Sub-Saharan Africa, mainly because of several overlapping challenges. If we start with the historical evidence, the track record of farmer cooperatives in Africa during the pre-adjustment era in relation to provision of essential services to members and poverty reduction has not been exemplary (Lele, 1981; Hussi et al., 1993; Akwabi-Ameyaw, 1997). Supported by governments, they functioned primarily as social service cooperatives rather than as business enterprises owned and managed by the members. They were not allowed sufficient marketing margins to cover their operational expenses and could therefore not evolve into commercially viable enterprises. This compromised their inherent character as member-controlled organizations, which in turn discouraged member participation and eroded confidence in the leadership (Lele, 1981). With structural adjustment and economic reforms, many of the service cooperatives lost their special protection from the state, which further reduced their viability in the ensuing competitive environment.

In addition to unsuccessful past efforts that continue to overshadow future directions, today’s farmer organizations face several internal and external challenges that could undermine their ability to compete more effectively or provide desired services at low costs to members. The first challenge is the complexity of demands and stakeholder interests affecting the role and functions of farmer organizations and the conflicting nature of the different needs. This includes the expressed agribusiness orientation of many farmer groups, which requires adherence to strict business principles and the overlapping demands for social inclusiveness, empowerment and poverty reduction in marginal areas, and working with vulnerable groups (Chirwa et al., 2005; World Bank, 2008). Inclusive membership may be consistent with economies of scale, but wider coverage may undermine economic performance by increasing transaction costs and bringing together conflicting interest groups. The resource-poor and marginal farmers with low supply response cannot make significant contributions in expanding marketed surplus and may even increase the risk of default in carrying out agreed contracts (e.g., credit payments and timely delivery of produce). Such inclusiveness may also pose challenges, as resource-poor members may not meet required standards for their produce in terms of food safety and quality. Producer organizations would therefore need to carefully balance the competing and often conflicting demands for meeting multiple social objectives and aim to focus on a narrow set of objectives where they have comparative advantages in delivering tangible services to small farmers.

The second challenge relates to the risks associated with globalization and the increasing competition with external market forces, including supermarket chains, transnational agri-food companies, and subsidized producers in distant locations. In liberalized markets, the success of producer organizations will depend on access to new technology for lowering the cost of production, consistency of supply and ability to produce required volumes, and ability to meet increasingly stringent food quality and food safety standards in the emerging agri-food industry. This indicates that producer organizations need to make careful and rational choices and re-examine where their strategic market opportunities lie. For farmers producing bulk grains and food staples, the markets are largely domestic and regional. For fruits and vegetables and other high-value produce (e.g., milk, meat, poultry) there are growing opportunities in domestic urban markets, but the ability to tap these markets will require increased organizational and technical capacity.

The third challenge is the ability to mobilize internal and external resources (including finance and marketing assets) to carry out their functions. This is particularly important in relation to accessing seasonal finance to pay for produce deliveries or procuring essential inputs. Financial services (including credit and insurance) and storage and transport facilities are under-supplied in many rural areas with inadequate market infrastructure. For example, for PMGs in Kenya the most important constraints to collective marketing identified by participating farmers included lack of credit or rural finance, inadequate market information, small marketed volume, low marketing and business skills, and limited technical capacity of farmers and group leaders (Shiferaw et al., 2008).
Determinants of success and performance

What determines success and effectiveness of producer organizations and what are the implications for policy? There are no standardized measures or indicators that can be used to assess the level, viability and effectiveness (performance) of farmer organizations. This implies that our assessment of determinants of effectiveness and performance cannot be made based on comparative statistics and quantitative measures of performance. Our approach here will therefore be based on a review of case studies that indicate the degree of participation, inclusiveness in generating benefits, volume of trade, and changes in price levels and technology adoption. The intention is to identify common relevant characteristics and attributes of farmer organizations and their businesses and managerial behavior and policy factors that could be positively associated with high performance.

However, much past research on performance and effectiveness of collective action focused on management of common property or community-managed natural resources. The classic impediments of collective action in this context are group size and inequality (Olsen, 1965). A number of factors, either internal or external to the group, identified as important determinants of effective collective action include clearly defined boundaries, monitoring, mechanisms for conflict resolution, recognition of rights to organize and presence of graduated sanctions to penalize violators (Ostrom, 1990). The empirical evidence on the role of any of these factors under specific situations is quite mixed. Recent years have seen some interest to examine the factors associated with performance of collective action institutions in the context of producer organizations and marketing. Some of the factors widely attributed to the success of collective efforts of producer organizations include homogeneity, size, choice of services, commercial activities, self-reliance and autonomy, access to finance, skills and education, participation, organizational structure and governance, legislation and focus (Stockbridge et al., 2003). Whereas the empirical evidence on the actual effect of many of these factors is currently lacking, the case studies in the literature do provide some useful insights that are relevant for policy.

The examples and experiences reviewed in this paper and others show that farmer organizations tend to succeed when: farmers can manage them autonomously with minimal government interference; farmers participate actively in decision-making at every stage of the process; and their cooperative activities are profitable (Bernard et al., 2008; Chirwa et al., 2005; World Bank, 2008). Clearly, participation in producer organizations will depend on the magnitude of expected benefits and associated costs. Participation is likely to occur if the gains, in terms of reduced transaction costs, better input and/or product prices, empowerment, and capacity enhancement outweigh the associated costs of complying with collective rules and norms. Performance of producer organizations also depends on leadership, good governance and participatory decision-making (Shiferaw et al., 2009). The potential for accessing essential services to improve agricultural incomes and tapping economic opportunities will act as a strong incentive for anyone contemplating membership. Existing skills/experience of members in relation to what is required to undertake joint activities; internal cohesion and membership-driven agenda; and the ability to effectively integrate into a wider commercial economy will determine the effectiveness of collective marketing cooperatives and marketing groups. This implies that measures designed to enhance marketing and business skills for farmer marketing groups and cooperatives will contribute to the success of producer organizations. Therefore, programs that are geared towards facilitating group self-reliance and enhancing organizational and business skills are likely to equip groups with the capacity to forge effective business interactions with the private sector and other market actors along the value chain for agricultural development (Bingen et al., 2003).

The functional orientation of farmer groups and their internal features are also important determinants of the success of farmer organizations. Larger groups may be less successful than small groups in furthering their interest, but only up to a certain threshold size. This is mainly because the transaction and managerial costs of cooperation increase faster than the gains as group size increases beyond a certain level (Hussi et al., 1993), which implies that optimal group size will depend on the type of joint activity and the features of the group.

Some design principles and policy issues

There are no blueprints and shortcuts for the success of producer organizations. Based on the experiences of the past with farmer cooperatives and current producer organizations, one may however suggest some good practices and policy options that improve the effectiveness, economic viability and competitiveness of producer organizations. These are summarized below:
- **Market opportunity identification** – Producer organizations face serious challenges in overcoming market impediments and in establishing competitive positions for many commodities. The existing evidence suggests that producer organizations perform better when dealing with cash crops (e.g., coffee, tea, cocoa, cotton, tobacco) and food products with high demand (e.g., fruits and vegetables, milk, etc.) in the agri-food industry, especially in the high-value markets connecting small producers with processors, exporters and retail chains. When there are no large alternative suppliers, the potential of collective action to aggregate the standardized and high-quality product from small producers to supply identified markets makes it mutually beneficial for the private sector and producer organizations to establish strategic partnerships. There are several such examples of success: potatoes to supply a fast-food outlet in Uganda (Kaganzi et al., 2009), green beans in Kenya and fruits in India (Narrod et al., 2009) and horticultural products in Honduras and El Salvador (Helin et al., 2009). The challenge is how to leverage these lessons and expand into other low-value crops and staple foods like cereals, cassava and pulses. This suggests that it would be useful for producer groups to carefully identify market opportunities in few tangible commodities of high comparative advantage and possibly leverage this to tackle marketing problems in other commodities. However, as Chirwa et al. (2005) propose, it is important that producer groups exercise caution in the process – first, building business skills and learning to be effective, second, being efficient and profitable, and third, learning to expand the scale and scope of their enterprise to exploit economies of scale.

- **Define exclusive benefits to members** – The greatest incentive for collective action in producer organizations originates from the economic benefits that cooperation will generate for members. If the costs are too high or when similar benefits can be accessed from other providers at comparable costs, the incentive for cooperation will be low. The key to success lies in the ability to provide competitive, continuing and valued or income-generating services to members.

- **Clear rules and norms for collective action** – Successful collective action is mediated by effective institutions that define the rules and norms of association and the enforcement mechanisms. This will create incentive systems for regulating and shaping the behavior and expectations of individual members and provide assurance to other market actors. The rules need to define the roles, rights, obligations and entitlements of individual members, and the organization itself.

- **Build trust and solidarity among the members** – Successful collective action in the new generation of producer organizations will require democratic participation and greater transparency and accountability systems to assure members on issues related to governance and financial management.

- **Partnership with the private sector** – Farmer organizations should not attempt to crowd out the private sector. They should try to define a niche in areas and commodities where they have a competitive advantage compared to private-sector traders and create linkages with wholesalers, processors, exporters, supermarkets and financial institutions to build more robust value chains. This should be mutually beneficial and help improve the performance of imperfect rural markets (e.g., credit, insurance, warehouse receipts). This relationship is now undermined by lack of trust and unproductive rivalry. Good business practices and ethical standards are required by both parties to establish trust in concluding business transactions and foster enforcement of contracts and agreements. The evidence on this in Africa is replete with stories of dishonest dealings and lack of compliance with advance contracts by producer organizations, as well as private traders and processors.

- **Professional management but low overhead costs** – The managers of producer organizations cannot always be elected from members and cannot be expected to provide free services. Serious producer organizations should consider ways to improve efficiency by cutting overhead costs without compromising professional management.
• **Policy advocacy and lobbying** – Many small producer organizations cannot be expected to influence policy decisions. At the micro level the focus should be on production, quality control, marketing and capacity building that bring higher economic benefits to members. Farmer unions and national associations at a higher level of organization can, however, play a role in advocacy and representation of the interests of small farmers in policy discussions. The benefits from such activities are generally inclusive and may even spill over to non-members.

• **Targeted external financial and technical support** – Given the high costs of organization and low capacity of many small producers, there is a need for governments and NGOs to provide targeted and clearly defined financial support as well as technical advice on organizational, managerial and marketing aspects. Investment in public goods infrastructure (roads, telecommunications, radio, internet, etc.) and needs-based capacity building and training in new ways of doing business and establishing partnerships is important for the emergence of successful groups. External financial and technical support should not, however, undermine self-reliance, sustainability and accountability to members. It should also not distort incentives and lead to other market failures.

• **Avoid ad hoc interference and promote independence** – Undue government interference in the management and leadership of farmer organizations is a chronic problem for the success of producer groups. In order to avoid any conflict of interest, politicians, the judiciary and law enforcement officers should neither be elected to the offices of producer organizations nor should they serve on the board of trustees that has an oversight mandate for such organizations.

• **Enabling legal and policy framework** – For farmer cooperatives to be effective in serving a broad set of socio-political and economic objectives, new policies and institutional reforms are needed to facilitate their transformation to become economically viable private-sector enterprises with clear business plans (Kelly et al., 2003; Shiferaw et al., 2009). This may require cooperative laws that specify legal requirements for democratic governance, independent and transparent system of auditing, quick investigation and resolution of corruption cases, as well as legal guidelines for contract farming, grades and standards for commodities, systems of arbitration and conflict resolution, access to seasonal finance and warehouse receipts to tackle capital constraints, and income tax benefits and other privileges to support producer organizations. It is important that the legal and regulatory framework does not lead to over-regulation that could stifle growth and development of small and nascent producer organizations (Shiferaw et al., 2008). For example, the Cooperatives Amendment Bill in Kenya requires that societies elect new office-bearers annually and maintain financial statements that meet international standards. Failure to meet these requirements may lead to dissolution (Republic of Kenya, 2004).

**Conclusions**

Market liberalization is a necessary but not sufficient condition for increasing access to markets by smallholder farmers in many countries of Sub-Saharan Africa. The expected economic growth from the market reform and liberalization policies has therefore largely remained unrealized. With imperfect rural markets and limited institutions to support market functions, these policies were bound to fail in integrating smallholder farmers in less-favored areas into the market system. These market imperfections or failures are the by-products of inadequate or lacking market infrastructure and supporting institutions, as well as policy failures (e.g., discretionary state interference and partial reforms) that impede the development and proper functioning of markets. Incomplete markets and institutional gaps impose significant costs in forgone growth and welfare losses for the rural poor and smallholder farmers. In order to remedy some of these market-related challenges in rural areas, producer organizations and collective marketing groups provide alternative institutional innovations to enhance the uptake of market-oriented and productivity-enhancing technologies, to link farmers to markets, and foster market participation and commercialization of smallholder production.

The experiences reviewed in this paper show that producer organizations can play a crucial role in improving access to markets and agricultural technologies and provide representation and voice to small producers. The market benefits are related to better opportunities both in output and input markets that increase producer prices and reduce input costs for small farmers. The benefits from scale economies in terms of reduced production and marketing costs or higher producer
prices create incentives for farmers to participate in farmer organizations. This has the potential to strengthen farmers’ market participation. Farmer organizations generate income and employment and facilitate economic coordination by providing other enterprises (e.g., financial institutions, input suppliers) and service providers traditionally constrained by high transaction costs (e.g., extension), an efficient route to reach a large number of otherwise inaccessible farm households. One important result of greater roles for farmer organizations is increased access of small producers to new technology, information and business services in rural areas that contribute to productivity growth, intensification and commercialization of smallholder agriculture.

Nevertheless, many farmer organizations continue to face complex challenges to perform and succeed under competitive market environments — only few relatively successful farmer groups are currently able to exploit this potential. Many producer organizations continue to suffer from inefficiency and lack of economic viability, which threatens their sustainability. This is caused by several factors, including poor market opportunity identification, inadequate managerial capacity, governance problems, lack of seasonal finance, increased external competition, and ad hoc interference by government and other agencies, which undermine accountability to members and long-term economic viability. There is a continuing challenge in balancing the traditional role of farmer networks and groups in providing non-commercial services to communities with the role of producer organizations in providing efficient market outlets and establishing competitive business enterprises in dynamic markets. While some of the benefits from producer organizations are likely to be inclusive, certain benefits can only be availed to members who can afford to pay the costs of association and participation. The economic viability of producer organizations will depend on their ability to provide services that generate higher net benefits to members relative to other providers. There is a risk that farmer organizations are being conceived as conduits for reaching the rural poor and small producers with unrealistic and often conflicting demands — including political, social, economic and environmental objectives. While carefully organized groups could balance between potentially less inclusive business objectives and other more inclusive “social development” mandates, these kinds of overlapping demands — especially at early stages of development — threaten the emergence of competitive farmer-owned business enterprises.

However, these lessons provide several insights for leveraging producer organizations to remedy market impediments in rural areas and integrate small producers into value chains. There is a need to provide targeted support to mobilize and organize farmers to tackle identified constraints — enhancing participatory governance and business skills, identification of market and business opportunities, establishing strategic partnerships with the private sector, facilitating access to information and technologies, and providing start-up capital and seasonal finance to enhance competitiveness. The complementary role of the private sector in the development of producer organizations is an important factor in this process. Government policies should not create situations for producer organizations to crowd out the private sector — but to stimulate competitiveness, trust and relationships based on comparative advantages. Many emerging producer organizations with clearly defined business plans need to be supported to transition into legally recognized business entities, and not remain as self-help groups or informal associations, which restrict their ability to access essential financial and other services from the formal sector. The effectiveness of many farmer marketing groups is hampered by lack of cash capital to pay in time for produce deliveries by farmers. Many small farmers find it difficult to delay payments, even when future prices would be significantly higher. Several options, including warehouse receipt systems, can be developed to tackle the problem of seasonal finance for producer organizations. Studies have shown that if early partial payment to meet basic needs can be made, small producers are capable and willing to defer sales and benefit from temporal and spatial arbitrage.

However, given the discredited and non-exemplary past experience of cooperatives in Africa, the new generation of farmer organizations must go through a slow process of building trust to overcome persistent suspicion and fear on the part of their members, potential members and business partners. This trust can only be nurtured through greater participatory and democratic governance, openness and transparency in financial management that enhances accountability to members, good business ethics and, finally, the rewards that they bring to their constituencies. Undoubtedly, if some of these challenges can be overcome, producer organizations can play a key role in helping integrate the disenfranchised small producers into the marketing systems, which could in turn create wealth and opportunities to increase agricultural productivity and reduce poverty.
References


Agricultural market development:
A synthesis of CIAT’s approach, priorities, experiences and case studies

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Abstract
Within the Consultative Group on International Agricultural Research (CGIAR), the International Center for Tropical Agriculture (CIAT) pioneered research in agro-enterprise development, rural innovation and linking farmers to markets. CIAT can distill key lessons from this experience and has developed several related tools that are widely used. Related to this, CIAT is collaborating with development NGOs, private and public sector agencies, and donors in development mechanisms for reaching millions of small farm families, including those in difficult-to-reach environments. Using three diverse examples, this paper summarizes the contributions and experiences of CIAT in research in agro-enterprise development, rural innovations and in linking farmers to markets. The paper also contributes to the debate on how to promote crops other than the major staples and traditional export crops, which tend to be the focus of policy support in most African countries. It also demonstrates that collective action and value addition are potential ways of making markets work for the poor in Africa, and recommends continued agricultural commodity market research, development and capacity building to enable African smallholder farmers to graduate into competitively accessing regional and international markets.

Background
Within the Consultative Group on International Agricultural Research (CGIAR), the International Center for Tropical Agriculture (CIAT) has pioneered research in agro-enterprise development, rural innovation and linking farmers to markets. Initially, the concept of development of agro-enterprises for CIAT’s mandate crops was applied to cassava, but later extended to research applicable to other crops and livestock systems. To date, CIAT continues to investigate more effective, sustainable and efficient approaches for linking farmers to markets and has over 20 years of experience in this. Today, an integrated approach to rural agro-enterprise development including participatory value chain analysis, inclusive governance mechanisms, participatory market analysis and tools to promote shared innovation and learning, comprise the suite of mechanisms for sustainably linking farmers to markets – an approach being implemented in all of CIAT’s mandate species and selected high-value crops benefiting the poor.

CIAT’s presence in Latin America, Africa and Asia facilitates learning that cuts across socio-economic conditions and institutional arrangements. From its global vantage point, CIAT is well positioned to distill key lessons and principles from action research and has developed significant in-house capacity as well as widely used tools. CIAT’s research is pro-poor and includes examining the extent and manner by which disadvantaged farmers in Africa can be linked to markets, and how women can maintain control of income from the crops they traditionally manage even as they become more commercialized. CIAT has learned that achieving the latter usually requires conscious investment in collective and marketing skills of women. CIAT has also learned to be concerned about the potential downsides of increased market linkage, for example in driving, at least in the short term, the mining of soil fertility. CIAT is, therefore, exploring the conditions under which increased income from market linkage encourages small farmers to invest in maintaining or improving their natural resource base.

CIAT’s tools are widely adopted and adapted by local and international partners, such as NGOs, National Agricultural Research Systems (NARS) and the private sector. For example, business manuals for small-scale seed enterprises in Africa are available in at least eight local languages, and a suite of “Good Practice Guides for Agro-enterprise Development” is in use in at least 32 countries. CIAT has a vast network of partners, both in the public and private sectors, which facilitates project development and implementation and enables co-learning in development. CIAT’s research on institutions and policies adds value to partners and benefits market-oriented smallholder growers. Through public-private partnerships, such as the

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Latin American Cassava Consortium (CLAYUCA) and the Latin America Irrigated Rice Forum (FLAR), CIAT is working with the private sector, national research organizations and international researchers to bring the benefit of research and development to small growers.

International research centers are a limited resource where demand for knowledge and skill outstrips the supply. CIAT is deeply involved in exploring the most efficient mechanisms to reach millions of small farm families, including those in difficult-to-reach environments. CIAT’s novel approach in linkage building with key constituencies has been instrumental to this. CIAT scales up impact by working closely with three key sets of partners. The first is development NGOs, to which CIAT provides improved tools for adaptation to diverse needs for more impact. In Latin America, this type of learning alliance encompasses 25 direct partner agencies that work with 80 additional partners to improve the livelihoods of more than 33,000 farm families in four countries. As a result of the first phase of the Central American learning alliance, NGO partners successfully generated over US$ 30 million in new project funding based on improved skills and capacities. In one such project, first year sales of small-scale farmers exceeded US$ 15 million.11 The second key partner is the private sector. CIAT works with corporate partners to develop new business models that benefit the poor. A new business model is one that provides both development benefit (i.e., inclusion, equity, participatory governance, sustainable natural resource management and increased income) as well as commercial benefit to other members of the supply chain. The New Business Models for Sustainable Trading Relationships project, supported by the Bill & Melinda Gates Foundation, is testing this approach in Africa with dried beans in Ethiopia, vegetables and flowers in Kenya, and cocoa in Ghana and Côte d’Ivoire, and includes partner corporations such as12 ACOS, ASDA-Walmart, Kraft and Hersheys. The goal is to identify practices and models that allow sustained and beneficial trading relationships for all involved. The third set of partners is public-sector agencies, including donors. With these actors the focus is on identifying critical investments and policies that facilitate development of vibrant and inclusive rural economies.

This work focuses on understanding the role of public policy on the development of value chains in Latin America. The goal is to expand these processes to governments in Africa and Asia and provide peer-based learning opportunities as governments design, implement and evaluate rural development and competitiveness policies.

Linking the above-mentioned three key constituencies requires knowledge management and cooperation among multiple partners. The role of CIAT is to facilitate knowledge management platforms from which specific processes of action research can take place, while undertaking additional research and working with the private sector as needed. By identifying common questions, testing ways to answer these questions through action research and drawing lessons, these platforms leverage dispersed knowledge to the benefit of rural communities. The outcomes from these processes of knowledge management include: i) improved methods and tools that contribute to effective development interventions and community skills development; ii) cross-site analysis and learning to identify what works, the context, and disseminate effective public and private policies and targeted training, and; iii) empirical knowledge that contributes to increased understanding of processes of rural enterprise development.

CIAT’s approach to linking farmers to markets combines multiple approaches and tools to work with the diverse constituencies that make up the innovation systems. The approach recognizes the critical importance of knowledge management and shared learning based on concrete experience in diverse contexts gained through action research. It also acknowledges that profitable enterprise development for the rural poor requires the development of capacities and skills along the value chain. Finally, as a global center CIAT seeks to support processes of South-South learning that contribute to improved market linkages, effective policies and sustained rural wealth creation. The remainder of this paper will provide three examples of CIAT’s approach, applied in Africa.

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11The ACORDAR project in Nicaragua is funded by USAID and is adapting CIAT methods and tools for work in beans, roots and tubers, coffee and high-value vegetable crops with over 5,000 small farm families. Sales data come from the first annual report presented to USAID in September 2008.
12Agricultural Commodity Supplies (ACOS) is an Italian dried pulse company http://www.acosnet.it/en/home/company; ASDA is the UK brand that Walmart uses hence the reference to ASDA-Walmart http://www.asda.co.uk/corp/home.html
Example 1: Value chain development in Africa – CIAT’s contributions

The challenge of developing value chains in Africa: theoretical aspects

Value chains in Africa have gained prominence in the last decade. Value chains can be considered networks of economic actors that span the various activities from production to consumption. A value chain is a specific type of supply chain – one where the actors actively seek to support each other to increase one another’s competitiveness. They invest time, effort and money, and build relationships to reach a common goal of satisfying consumer needs and increasing their profits. Thus a value chain is a high-level model of how businesses receive raw materials as input, add value to the raw materials through various processes, and sell finished products. Managing value chains goes beyond the single enterprise. Value chains are no longer a preserve of large firms and have increasingly been recognized to play critical roles in smaller firms (e.g., farm enterprises). They ensure that the poor are not left out of gainful economic activities. The value chain approach can be considered a strategy for aligning actors behind shared common perspectives of where to go and how to get there, as well as the actors behaving in a certain way so as to achieve their shared goals. Schmitz (2005) distinguishes four types of value chains:

**Arm’s length market relations**: Buyer and supplier do not need to develop close relationships because the product is standardized or easily customized. Buyers easily switch suppliers.

**Modular networks**: Firms develop information-intensive relationships. The buyer provides the specification and highly competent suppliers provide products and services.

**Captive networks**: Here, a firm exercises a high degree of control over other firms in the chain and occurs when the buyer has doubts about the competence of the supply chain.

**Hierarchy**: A lead firm takes direct ownership of some operations in the chain.

Value chain development has at least two objectives. One is to improve local or regional value chains to enable them to export their products to other countries. This ensures that the firms are recognized for their quality products and standards, improved from value chain partnership. Second, value chain development increases local trade for firms that do not export by improving profitability through appropriate responses (Meyer-Stamer, 2005). In Africa, production units do not have the common ideal characteristics that can lend themselves to value chain management. Production units are characterized as small-scale, labor intensive and subsistence-oriented. Thus, the development of value chains has to recognize the large number of small participants necessary to achieve economic quantities if they are induced to be commercial-oriented.

Dorward and Kydd (2005) observe that there is need for caution so as not to take the principle of making markets work too far. According to them, highly fragmented markets can lead to prohibitively high transaction costs, creating barriers to entry. One of the bottlenecks is given as “asset specificity”. Therefore, in a competitive market with high information cost and little direct communication between market participants, entrepreneurs may hesitate to invest in anything that displays high asset specificity. Dorward and Kydd (2005) further point out that atomized agricultural markets in African locations are creating high transaction cost that they are ultimately dysfunctional. While economic research has formulated the market/hierarchy/network triads of modes of coordination (Powell 1990; OECD, 1992), social scientists tend to distinguish market, organization and community (e.g., Wiesenthal, 2000). What is important in both strands of theorizing is the observation that in the real world it is highly unlikely that any pure mode of coordination will work. When a market does not work, the adequate answer is, in all likelihood, not more freedom in the market but rather more hierarchy and organization. Markets with lots of small suppliers and customers are real in rural Africa, yet they do not work well since it is time consuming and costly for customers to get a comprehensive picture of the variety and quality of produce on offer (Fafchamps, 2004, in Dorward and Kydd, 2005). Hierarchies, for instance out-grower systems that are managed by a major company, can turn out to be significantly more wealth-creating than markets under such circumstances.

**Operationalizing value chain development: The CIAT experience**

“Linking Farmers to Markets” is one of the outcome lines of CIAT. Within this outcome line are such projects as Farmer to Markets, the Integrated Soil Productivity Initiative through Research and Education, and Making Markets Work for the Poor. Implicitly, the theme is pro-poor, focusing on groups of producers who will not spontaneously link up with external buyers because of a wide gap between their supply capacity and the demand, probably
due to insufficient skills, unfavorable location, and disabling environments (Meyer-Stamer, 2005). Besides output markets, emphasis is also placed on factor markets. CIAT’s Enabling Rural Innovation’s method combines specific approaches (identification of bottlenecks, designing interventions, entrepreneurship promotion, management training, business development services, etc.) to develop value chains.

**Where to next? On-going projects**

CIAT has been applying value chain development through a number of projects over the past few years. Market value chain analysis has been used as a basis for selecting enterprises around which to create innovation platforms. The most promising enterprises are selected by the producers using participatory approaches. A number of CIAT’s projects combine standard research with action research. Development NGOs help to mobilize farmers. Using participatory rural appraisal (PRA) approaches, several enterprises are preselected for inclusion in value chain analysis. Producers are guided through on participatory market research skills and are able to use the same knowledge to compile market research reports, which together with the results of the value chain analysis are discussed to select profitable enterprises. Participatory market research provides information on available market opportunities and margins. Value chain research provides detailed information on margins at the farm and market levels. Two to three value chains are then selected. Innovation platforms, consisting of various stakeholders associated with the enterprise of interest (inputs’ suppliers, germplasm producers, micro-financiers, traders, etc.) are then formed around the selected value chains to achieve synergies and mutual benefits.

CIAT’s projects in the East and Central Africa region are testing to see “whether integrated development initiatives lead to improvement in the welfare of households involved through profitable association in the markets using the selected market value chains”. Conventional research approaches are then compared with the integrated research approach. Results are not yet available to prove that value chains will improve the economic well being of the household compared to conventional research approaches.

**Profitability and enterprise selection: The Consortium for Improvement of Agricultural Livelihoods in Central Africa (CIALCA) experience in Rwanda and the Democratic Republic of Congo (DRC)**

CIAT’s value chain approach is being applied in Rwanda and DRC to evaluate the influence of various technological interventions on profitability of grain legumes and to evaluate what determines technology uptake. The projects are under the CIALCA, a partnership of CIAT, the International Institute for Tropical Agriculture (IITA), and Bioversity International. The studies seek to identify the most profitable technology and plot conditions at the farm level and the profitability of common bean, soybean, groundnut, cowpea, and pigeon pea at the market level. These evaluations are taking place in the Bugesera, Umtara, Gikongoro and Kubungo regions in Rwanda and in the Ngweshe and Katana areas of Sud Kivu province of the DRC. In Rwanda, provisional results indicate that planting in upland plots was the most profitable for all legume types (see Table 1). For soybean, the most profitable condition was pure stand in upland plots, Gikongoro reporting the highest profitability. Common bean was most profitable when intercropped, Kibungo reporting the highest profitability. Groundnuts were most profitable when planted as pure stands and the highest profitability was reported in Kibungo. These results show that, at farm level, while soybean recorded the lowest relative profitability, groundnuts recorded the highest profitability.

The three legumes in Table 1 were also evaluated for their profitability at the market level. Preliminary results indicate that all the three returned positive profitability for all the chain

<table>
<thead>
<tr>
<th>Grain legume (system)</th>
<th>Area or region</th>
<th>Gikongoro</th>
<th>Gitarama</th>
<th>Kibungo</th>
<th>Bugesera</th>
<th>Umtara</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soybean (Pure stands)</td>
<td>51</td>
<td>6.57</td>
<td>23.33</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Bean (Intercropped, except at Umtara)</td>
<td>_</td>
<td>_</td>
<td>91</td>
<td>59.25</td>
<td>57*</td>
<td></td>
</tr>
<tr>
<td>Groundnuts (pure stand)</td>
<td>_</td>
<td>_</td>
<td>118</td>
<td>102</td>
<td>106</td>
<td></td>
</tr>
</tbody>
</table>

All figures in Rwanda Francs. 1.00 US$ = 540 Rwanda Francs. A “–” means the enterprise was not evaluated in the region; * implies pure stands.
actors (see Table 2 for Rwanda and Table 3 for DRC). However, assemblers/transporters returned the highest profitability compared to other actors. Wholesalers had the lowest profit. In the DRC, farm-level preliminary results for two regions (Katana and Ngwese) indicate that common bean was profitable in both regions. The study in DRC was carried out under ordinary operating (farming and business) conditions. In the Ngwese region, peas were the most profitable enterprise. At the general household level, only common bean and peas had positive margins.

Table 2: Profitability per kg of legume enterprise at the market level in Rwanda

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>Value chain actor</th>
<th>Collectors</th>
<th>Retailers</th>
<th>Wholesalers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common bean</td>
<td>13</td>
<td>10</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>Groundnut</td>
<td>9</td>
<td>4</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>Soybean</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

All figures in Rwanda Francs. 1 US$ = 540 Rwanda Francs

Table 3: Farm level profitability in legumes in selected regions in Sud Kivu province, DRC

<table>
<thead>
<tr>
<th>Enterprise</th>
<th>Katana (Francs per ha)</th>
<th>Ngwese (Francs per ha)</th>
<th>All households (pooled) per kg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Common bean</td>
<td>21050</td>
<td>26316</td>
<td>4.70</td>
</tr>
<tr>
<td>Groundnuts</td>
<td>-12300</td>
<td>-</td>
<td>-10.70</td>
</tr>
<tr>
<td>Soybean</td>
<td>-41340</td>
<td>299</td>
<td>-18.00</td>
</tr>
<tr>
<td>Cowpea</td>
<td>-321400</td>
<td>-</td>
<td>-69.60</td>
</tr>
<tr>
<td>Pea</td>
<td>_</td>
<td>55260</td>
<td>27.20</td>
</tr>
</tbody>
</table>

Currency: Congolese Francs

Example 2: Organizing smallholder farmers to link to markets – enabling rural innovation in Africa

For farmers to thrive in the global economy, it is necessary to create an entrepreneurial culture in rural communities where “farmers produce for markets rather than try to market what they produce” (Lundy et al., 2002), and to organize to take advantage of economies of scale and more bargaining power.

![Figure 1: Keys steps in the Enabling Rural Innovation approach](image-url)
This has placed renewed attention on institutions of collective action – most often realized through farmer groups – an important and efficient mechanism for enhancing the marketing performance of small farmers (Kariuki and Place, 2005). While many studies have documented impressive results of linking farmers to export markets, small farmers have rarely benefited from these, as niche markets tend to be highly specialized and competitive, with rigorous quality standards (Diao and Hazell, 2004). Domestic and regional markets, however, still represent a growing opportunity for small farmers in Africa to diversify into high-value products.

In East and Southern Africa, CIAT has been using the Enabling Rural Innovation (ERI) to organize and link smallholder farmers to markets, develop agro-enterprises, strengthen social organization and entrepreneurial skills, and link to research and other services in support of their enterprises. It is a partnership of national agricultural research and extension systems, NGOs and CIAT, working together with rural communities and farmer organizations. The approach uses a resource-to-consumption framework, which builds linkages between production, marketing and investments in the natural resource base (Kaaria and Ashby, 2001). Figure 1 shows the steps in organizing farmers to produce for the market and balance food security and markets.

This paper uses two case studies from Malawi and Uganda to highlight the key steps and procedures in building capacity among farmers, farmers’ groups, and communities; to identify and evaluate market opportunities; and to develop profitable agro-enterprises and intensify production, while sustaining the resources upon which livelihoods depend.

The Tigwirane Dzanja Club, Katundulu, Malawi
The ERI work started its operations in Katundulu village, Ukwé Extension Planning Area (EPA), Lilongwe District in 2003. This was implemented in partnership with the Department of Agriculture Research Services (DARS) and Lilongwe Agricultural Development Division (LADD). The community formed a group called “Tigwirane Dzanja Club”, meaning, “Let us hold each other’s hand”. The purpose was to alleviate poverty through group action. The community observed that it was difficult to disentangle itself from these problems through individual efforts and therefore decided to join hands in order to learn together, sharing ideas and experiences. In partnership with DARS and LADD, the community was taken through the ERI steps, starting with participatory diagnosis, market opportunities identification and enterprise selection, farmer participatory research and gender and HIV/AIDS awareness, similar to Chinseu community. The community then selected four committees: the main committee, which also served as the participatory monitoring and evaluation committee; a participatory market research (PMR) committee; a farmer participatory research committee; and a livestock committee. To manage the process, the group was also trained in group dynamics and leadership, gender, and HIV/AIDS. With very little previous marketing experience, the PMR committee, together with external facilitators, carried out market assessments (e.g., open air markets, city markets, hotels, schools, etc.) to identify market options and understand needs. The group analyzed the results using profitability analysis and evaluated the options. Two enterprises were selected: common bean (common subsistence crop in the area) and pigs (new enterprise with which farmers had no prior experience).

Farmers were then trained in pig production, feed formulation, pen construction and disease management. Farmer participatory research was initiated to test different options for pig feeding, and growing of different replacement substitutes such as pigeon peas, soybeans and potato vines.

While the farmers have been very successful in supplying local markets with piglets (the main buyers are other farmers and NGO projects), they have been unable to meet the stringent quality needs of the meat-processing factory, which currently imports pork from Brazil. The market for piglets is an attractive option as piglets are sold within one month of birth, thus avoiding the competition for food between pigs and people arising during dry season. At the moment, the farmers cannot meet the demand for piglets. Pig production has become a common activity for households. When they sell piglets to NGOs, farmers earn additional income from the training they provide to recipient farmers. Farmers also earn up to US$ 1,000 from sale of pigs and training of other farmers.

Nyabyumba United Farmers’ Group, Kabale, Uganda
The Nyabyumba United Farmers’ Group is located in Kamuganguzi sub-county of Kabale District in southwestern Uganda. Over 90% of the population is engaged in small-scale farming. The group was formed in 1998 as a Farmer Field School with the aim of producing seed potato of top quality. Group dynamics support was provided by Africare (an international NGO that earlier provided the farmers with seeds of other crops, such as beans and hybrid maize seed). In 1999 the group became
a member of the Uganda National Seed Potato Producers’ Association, with 20 members. For 3-4 years, the association successfully produced seed potato, selling mostly to NGOs in the area who supplied other farmers freely. Increased seed potato sales led to the formation of an association of six groups with 120 members, 60% women. By 2004, demand for seed potato ceased as farmers were unable to sell increased volumes of ware potatoes. CIAT went in to work with the Nyabyumba group and Africare to test participatory marketing approaches. An initial step consisted of the farmers mapping the chain of actors and identifying service providers in the existing potato system. This was followed by participatory market research to identify various marketing channels for ware potatoes from the site. Farmers identified a number of markets (e.g., wholesale, retail, supermarkets, hotels, fast food chains, etc.). The analysis collated information on basic buying conditions (price, frequency of purchase, quality needed, payment conditions, etc.). Based on this, the group decided that linkage to Nandos (a multinational fast-food restaurant) was the most attractive option. Nandos utilizes ~5-10 tons of fresh potatoes each month.

Based on discussions between the group and Nandos, they carried out profitability analysis. Results showed that the enterprise could be profitable if farmers sold to Nandos throughout the year. All parties agreed upon terms and farmers moved to detailed planning. During planning, farmers noted that they would need to change their production system and include other farmer groups to meet the quantity desired by Nandos. A participatory evaluation process was initiated to test different technologies for potato production with the aim of achieving the market quality needs. Some of the specific issues of experimentation were new varieties, potato size, and moisture content. Farmers also required services (transport, finance, communications, marketing support, research support, etc.). Size and moisture content problems led to high rejection rates of initial consignments. However, through trials, rejection rates were reduced rates to < 10%. In 2 years, the farmers sold 50 tons of potatoes to Nandos at a total value of about US$ 50,000. Since the farmers became able to engage with the market, their earlier external service providers started withdrawing, moving to other groups. Farmers also managed to deal with the problem of poor savings and credit services by setting up savings and loans schemes.

In both the Uganda and Malawi cases, there was strong evidence of a positive impact on income. Average household earnings were higher in sites where the approach was implemented than in other sites. In Malawi, the additional income earned was used to improve food security, accumulate assets, improve living conditions, and purchase mineral fertilizers. In Uganda, the emphasis was on improving living standards and the purchase of farmland. An explicit attention to gender issues in the approach resulted in more equitable sharing of benefits than previously. However, in Malawi, as common bean became increasingly commercialized, the income share of women fell, although their absolute income continued to increase.

While forming farmer groups is recognized as essential to making learning more efficient, for receiving support, and for achieving economies of scale, simply being in a group does not ensure success in the market place. There is growing evidence that farmer groups that are formed hastily, with little reference to building trust and linking to markets, tend to fail through lack of benefits (Sanginga et al., 2004). Dedicated and committed leadership is a vital ingredient if farmers’ groups are to access and maintain links to markets. As groups take on more risks and increase their assets, governance and transparency are essential to success. All markets carry risk and prices of agricultural products are often volatile. Risks increase as market values increase. Farmers need to be fully aware of their exposure and ability to deal with risks. Contrary to the common view that farmers are risk-averse, the Nyabyumba farmers decided to link with a high-value market, taking on debt and investing in high-value capital assets, such as the purchase of trucks. For the less experienced farmers in the Malawi case, taking on a relatively new enterprise was risky. The step-by-step approach taken helped to build their confidence in enterprise management.

Example 3: Model for agricultural market creation in Africa – soybean in Kenya

Agriculture is failing to be the engine of economic development in many African countries. This has been attributed to failure in linking agricultural growth with market opportunities (Kormawa, 1996). Even where farmers are linked with markets, the terms are frequently unfavorable. Studies have shown that investments in non-traditional crops provide a profitable option (Kormawa, 1996). Experiences with soybean (Glycine max) promotion in Nigeria and Zimbabwe confirm this finding. As a result, the Tropical Soil Biology and Fertility institute of CIAT began to explore the possibility of intervening in the soybean sector in Nigeria.
East Africa. However, most past efforts at promoting soybean in Kenya led to insignificant results; domestic production stands at about 5000 tons per annum (Karuga and Gachanja, 2004). Several industries in Kenya continue to import 50,000–100,000 tons of soybeans annually (Karuga and Gachanja, 2004). Meanwhile biophysical conditions in many parts of Kenya support soybean production. This study uses the reasons for successes in Nigeria and Zimbabwe and the missing links that led to past failures in Kenya to test a three-tier model for sustainable soybean promotion in Kenya. Data collection was from: i) literature review and other secondary sources, ii) formal and informal interviews using a checklist, and iii) formal farm-level survey using data forms. Analysis was carried out using Microsoft Excel and SPSS.

Review of Nigerian experience and reasons for success
Soybean promotion in Nigeria was largely driven by domestic demand, import substitution, and favorable policy. Production increased by 166% (150,000 tons in 1988 to 405,000 tons in 1998) (FAOSTATS, 2001) and there was widespread incorporation into local dishes. Over the period, average yields more than doubled (from 340 to 740 kg/ha); area cultivated increased by 24%; the number of farmers cultivating improved varieties increased by 228% (Sanginga et al., 2003); and more women got involved. The rate of adoption of some processing technologies was as high as 99% in some communities (Sanginga et al., 1999). A combination of approaches (facilitation, incentives, collective action, capacity building, demand creation, processing and value addition, information exchange, credit facilities, etc.) was responsible for the success in Nigeria. Through a project funded by the International Development Research Centre and implemented by IITA between 1987 and 1999, over 47,000 persons (64% of them women) were trained by 1998 (Sanginga et al., 1999). Development of simple methods of processing for home consumption, response to market needs, and profitability played key roles (Osho, 1989; Kormawa, 1996). Coordination ensured that processors and producers got along on mutually beneficial terms, volumes, prices and qualities.

Review of Zimbabwean experience and reasons for success
The soybean promotion success story in Zimbabwe resulted from smallholder-focused intervention led by the University of Zimbabwe. It started with 55 small farmers in 1996 and was supported by the government through the creation of the Soybean Promotion Task Force (SPTF). Over 50,000 smallholders (working in groups) are presently participating, producing over 40,000 tons of soybean annually. Farmers’ groups were trained to process and sell various soy products for cash. Some groups have expanded into establishing village banks, accepting deposits and giving credit. Zimbabwe has well-developed capacity for oil extraction and feed formulation using soybean. Following the activities of the SPTF, Olivine Industries Ltd., a private firm, guaranteed to buy all soybean produced by small farmers at agreed prices for different qualities. The goal was to incorporate smallholder soybean farmers into the value chain, not just production. Household and community-level processing were used to effectively develop other levels of the soybean market to increase the benefits to small farmers. Public policy and institutional support played a key role.

Review of reasons for failure in Kenya
Lack of awareness regarding processing, lack of markets with favorable terms, low yields, and lack of policy support were among the main reasons for failure of past Kenya soybean projects (Karuga and Gachanja, 2004). Most of the projects were isolated, limited in scope, and lacked coordination among stakeholders, leading to lack of market information (buyers’ needs, local soybean availability, etc.) and poor linkage of producers and processors. Buyers had difficulties knowing where to source soybean. There was no effort to assemble produce (e.g., through contracts) from farmers who also did not operate organized marketing with low transaction costs to attract buyers. Emphasis was on establishing a strong production base. Most households that knew anything about soybean processing were aware of insignificant uses, inimical to widespread consumption and could hardly lead to demand expansion. Cottage industries and other commercially viable small and medium-scale enterprises failed to spring up in support of processing, and this was compounded by a lack of affordable processing technologies. Inadequate technical capacity and resources constrained the ability of extension and home economics staff to train households on processing and consumption. Soybean production in Kenya competes with low-priced imports. The Cost Insurance Freight (CIF) Mombasa (Kenya) price of soybean meal was about US$ 280/t [or Kenya Shilling (KShs) 22.4/kg] (Karuga and Gachanja, 2004) – a price far lower than the farm-gate price of 35-45 KShs/kg and the open market price of 50-60 KShs/kg for soybean in Kenya, creating strong incentives for importation. However, the turnover effect of the relatively lower market clearing prices given by processors offer better opportunities.
for increased income and poverty reduction. Collective actions among farmers were largely not explored and there was little or no policy attention.

**Three-tier model**

We developed a “three-tier model”, supported by three pillars (Strategic Alliance of stakeholders, awareness creation, and capacity building) for sustainable soybean market development and promotion in Kenya. The first tier focuses on household-level production, aiming to train households on processing. Recipe development and inclusion of soybean in local dishes are key aspects. The second tier focuses at community level. Surpluses after household consumption are absorbed and processed. VitaCow or Vitagoat milk making machines are used in some cases. Farmers’ groups can afford VitaCow via collective action (delivery and installation costs range from 435,000-637,500 KShs or US$ 5,800-8,500). Vitagoat performs at 70% capacity of VitaCow, which converts 2.5 kg of pre-soaked soybeans into 15 liters of soy milk. By-products from milk production are used to make such products as bread and cake. This tier forestalls produce glut at household level. The third tier is industrial-level soybean market development, linking farmers to processors for import substitution and to clear the market at agreed prices. It involves interacting with the industry to find out what it needs, and with farmers to evaluate their ability and requirement to deliver products that meet industrial specifications. Three pillars support the model. The first is a strategic alliance (SA) of stakeholders. Processors are not keen on local supply at current volumes, and farmers would not invest in production without assured markets. An alliance brought all stakeholders together to: i) solve the entire problem, ii) put each stakeholder within a larger framework, iii) analyze perceptions of different actors, iv) facilitate trade, and v) deal with duality. Representatives of each stakeholder in the SA articulate and present their views at SA meetings, and provide feedback to members. Awareness creation is the second pillar and is about agronomy, post-harvest activities, marketing, nutrition, etc., emphasizing various benefits and how all stand to gain, correcting wrong ideas about soybean. The third pillar is capacity building (on how all can obtain the various benefits) for sustainability in all tiers.

**Results from the model**

**Growth in farmers’ groups:** Farmers’ interest has been stimulated. Between 2005 and 2007 (6 cropping seasons), the number of farmers’ groups (15–130 members) growing soybean has increased from 7 (during the long rains of 2005) to 121 (during the short rains of 2008) across the action and non-action sites13. The corresponding area planted to soybean by farmers’ groups increased from 5.7 to 100.9 ha (Table 4). About 30 farmers’ groups from outside the action sites (e.g., Kisumu Rural, Teso, Busia and Kakamega districts) are currently participating in the project. With women playing a dominant role in the production and processing of soybean, the intervention clearly has a positive impact on their empowerment. The intervention also has a positive impact on the establishment of local enterprises. Over the years, farmers are increasingly generating

<table>
<thead>
<tr>
<th>Period</th>
<th>Migori action site</th>
<th>Butere-Mumias action site</th>
<th>Outside action site</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>No. of zones/groups</td>
<td>Area (ha)</td>
<td>No. of groups</td>
<td>Area (ha)</td>
</tr>
<tr>
<td>Long rains 2005</td>
<td>3</td>
<td>4.1</td>
<td>4</td>
<td>1.6</td>
</tr>
<tr>
<td>Short rains 2005</td>
<td>6</td>
<td>16.3</td>
<td>16</td>
<td>6.2</td>
</tr>
<tr>
<td>Long rains 2006</td>
<td>7</td>
<td>16.3</td>
<td>26</td>
<td>14.3</td>
</tr>
<tr>
<td>Short rains 2006</td>
<td>7</td>
<td>16.3</td>
<td>38</td>
<td>22.3</td>
</tr>
<tr>
<td>Long rains 2007</td>
<td>7</td>
<td>17.2</td>
<td>68</td>
<td>31.0</td>
</tr>
<tr>
<td>Short rains 2007</td>
<td>7</td>
<td>19.3</td>
<td>68</td>
<td>33.1</td>
</tr>
<tr>
<td>Long rains 2008</td>
<td>7</td>
<td>23.2</td>
<td>74</td>
<td>34.9</td>
</tr>
<tr>
<td>Short rains 2008</td>
<td>7</td>
<td>25.2</td>
<td>80</td>
<td>38.8</td>
</tr>
</tbody>
</table>

13Refers to our initial areas of concentration

Table 4: Growth in farmers’ groups involved in soybean promotion in Kenya: 2005-2007
marketable surpluses; some are becoming regular and reliable suppliers to processing firms. Over 50% of the soybean farmers have 20-30% more income than before.

**Profitability of production:** Economic data collected from plots of four farmers’ groups and two farmers are presented in Table 5. Yield ranges from 445 to 1,245 kg/ha (mean 715 kg/ha). Production costs varied from 9,662 to 26,943 KShs/ha (mean 18,343 KShs/ha). Net returns ranged from –258 to 42,685 KShs/ha (mean 17,401 KShs/ha). Unadjusted labor costs accounted for 75-84% of the total cost of production (Table 5, rows II–V), going down with adjustment of labor inputs due to small plot sizes and showing how net returns depend on yield and labor use.

**Household processing and consumption:** Over 90% of households interviewed in 2005 were not processing and consuming soybean on regular basis. They lacked processing skill. The few that processed and consumed soybean on regular basis were only able to process it into nuts or beverages. Recent data show that about 55% of the households in the study area now process and consume soybean in one way or another. Over 75% of the households have been trained in processing methods and now make flour, milk, maandazi, chapati, etc. also for income.

**Profitability of soy milk production:** We carried out financial analyses of soy milk production using VitaCow under two the price scenarios. In the optimistic scenario (Column II, Table 6), the price of imported soy milk in supermarkets was used. In the pessimistic scenario (Column III, Table 6), based on our understanding that soy milk is new and must compete with dairy milk, we applied a price (KShs 40/liter), which was two-thirds the price of dairy milk (KShs 60/liter). The price of soybean grains (KShs 40/kg) applied under both scenarios was conservative. A net benefit per month of KShs 145,979 (pessimistic scenario) and KShs 530,171 (optimistic scenario) indicates a highly profitable enterprise. With these net returns, the cost of VitaCow can be recovered in 4-5 months, ceteris paribus. Since variable costs are the same in both scenarios, results show the effect of high

![Table 5: Cost-returns analysis of soybean production in Kenya: long rainy season 2005](image)

<table>
<thead>
<tr>
<th>Farmers’ group/ Farmer</th>
<th>Plot size (acres)</th>
<th>Yield (kg/ha)</th>
<th>Cost of all inputs* (KShs/ha)</th>
<th>Gross returns (@ KShs 50/kg)</th>
<th>Net returns (KShs/ha)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jitolee women</td>
<td>0.25</td>
<td>741.3</td>
<td>26021.05</td>
<td>37065.00</td>
<td>11043.95</td>
</tr>
<tr>
<td>Itako women</td>
<td>0.25</td>
<td>533.7</td>
<td>26943.38</td>
<td>26685.00</td>
<td>-258.38</td>
</tr>
<tr>
<td>Shishebu farmers</td>
<td>0.25</td>
<td>1245.0</td>
<td>19565.22</td>
<td>62250.00</td>
<td>42684.78</td>
</tr>
<tr>
<td>Emabole farmers</td>
<td>0.25</td>
<td>771.0</td>
<td>14525.69</td>
<td>38550.00</td>
<td>24024.31</td>
</tr>
<tr>
<td>Richard Aringo</td>
<td>0.25</td>
<td>553.4</td>
<td>13339.92</td>
<td>27670.00</td>
<td>14330.08</td>
</tr>
<tr>
<td>Boaz Kivanda</td>
<td>1.00</td>
<td>444.8</td>
<td>9661.48</td>
<td>22240.00</td>
<td>12578.52</td>
</tr>
</tbody>
</table>

* Labor cost was reduced to 33% because of small size of plots.

![Table 6: Returns on soymilk production using VitaCow – optimistic & pessimistic price scenarios](image)

<table>
<thead>
<tr>
<th>Budget item</th>
<th>(KShs)*</th>
<th>(KShs)*</th>
</tr>
</thead>
<tbody>
<tr>
<td>5,760 liters of soymilk @ 106.7 KShs/liter</td>
<td>614,592.00</td>
<td>-</td>
</tr>
<tr>
<td>5,760 liters of soymilk @ 40 KShs/liter (2/3 of the price of dairy milk)</td>
<td>-</td>
<td>230,400.00</td>
</tr>
<tr>
<td>Total revenue/month</td>
<td>614,592.00</td>
<td>230,400.00</td>
</tr>
<tr>
<td>960 kg soybean grains @ KShs 40/kg</td>
<td>38,400.00</td>
<td>38,400.00</td>
</tr>
<tr>
<td>11,520 packaging sachets @ KShs 1.05 each</td>
<td>12,096.00</td>
<td>12,096.00</td>
</tr>
<tr>
<td>Cost of electricity @ KShs 7,500/month</td>
<td>7,500.00</td>
<td>7,500.00</td>
</tr>
<tr>
<td>Salary of Operator @ KShs11,250/month</td>
<td>11,250.00</td>
<td>11,250.00</td>
</tr>
<tr>
<td>Salary of Packer/Sealer @ KShs7,500/month</td>
<td>7,500.00</td>
<td>7,500.00</td>
</tr>
<tr>
<td>Miscellaneous expenses @ 10% of all above costs</td>
<td>7,674.60</td>
<td>7,674.60</td>
</tr>
<tr>
<td>Total variable cost/month</td>
<td>84,420.60</td>
<td>84,420.60</td>
</tr>
<tr>
<td>Net benefit/month</td>
<td>530,171.40</td>
<td>145,979.40</td>
</tr>
</tbody>
</table>

* (US$ 1 = KShs 75); Column II = Optimistic scenario; Column III = Pessimistic scenario
price on profitability. This analysis has demonstrated how value addition can increase returns by 4 to 14 times, from KShs 38,400 (from sale of the 960 kg of soybean used as grain) to KShs 145,979 (pessimistic scenario) or KShs 530,171 (optimistic scenario) (converting the 960 kg soybean into soy milk).

Economic returns from processing other products: We evaluated economic returns from processing other soy products: maandazi, chapati, chin chin, and puff puff, taking into account all input costs and village-level output prices (Table 7). An opportunity cost approach was used to estimate labor cost. The time (minutes) taken to process the recipes evaluated was 15 for maandazi and puff puff, 25 for chapati, and 30 for chin chin. Net returns (in KSh) for the products produced within those times were 51 (chapati), 159 (puff puff), 204 (maandazi), and 508 (chin chin). Returns to each KSh invested were 0.43 (chapati), 1.2 (maandazi), 1.6 (puff puff), and 2.4 (chin chin), showing that soybean processing and sales of products have promise in market creation and poverty reduction in Kenya.

Table 7: Summary returns from processing maandazi, chapati, chin chin and puff puff

<table>
<thead>
<tr>
<th>Summary budget item</th>
<th>Maandazi</th>
<th>Chapati</th>
<th>Chin chin</th>
<th>Puff puff</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total revenue *</td>
<td>369.0</td>
<td>170.0</td>
<td>720.0</td>
<td>260.0</td>
</tr>
<tr>
<td>Total variable cost **</td>
<td>164.7</td>
<td>118.6</td>
<td>211.7</td>
<td>101.3</td>
</tr>
<tr>
<td>Net benefit</td>
<td>204.3</td>
<td>51.4</td>
<td>508.3</td>
<td>158.7</td>
</tr>
<tr>
<td>Break-even price</td>
<td>1.3</td>
<td>7.0</td>
<td>1.5</td>
<td>2.0</td>
</tr>
<tr>
<td>Returns to each KSh invested</td>
<td>1.2</td>
<td>0.43</td>
<td>2.4</td>
<td>1.6</td>
</tr>
</tbody>
</table>

* Derived as: 123 maandazi @ KShs 3 each, 17 chapatis @ KShs 10 each, 144 chin chin packets @ KShs 5 each, and 52 puff puffs @ KShs 5 each; ** Cost items: soy flour (2 cups or 0.5 kg), wheat flour (6 cups or 1 kg), baking powder (8 teaspoonfuls), sugar (1 glass), salt (1 pinch), vegetable oil, fuel wood, labor (15 minutes) (maandazi); soy flour (2 cups or 0.5 kg), wheat flour (6 cups or 1 kg), cooking fat, salt (1 pinch), fuel wood, labor (25 minutes) (chapati); soy flour (3 cups or 0.75 kg), wheat flour (6 cups or 1 kg), egg, cooking fat, sugar, fuel wood, labor (30 minutes) (chin chin); soy flour (2 cups or 0.5 kg), wheat flour (3 cups or 0.5 kg), yeast, sugar, fuelwood, labor (15 minutes) (puff puff).

Interactions with stakeholders: Results underscore the importance of interacting with various stakeholders in the SA. Different stakeholders had different viewpoints. Interactions with industry leaders reveal the importance of i) negotiating import substitution, ii) understanding grain qualities they desire, iii) ascertaining the price processors want to offer for different grades, and iv) the other mutually beneficial collaboration between producers and industries.

Sale of grain to industries: Notwithstanding that most industries want minimum amounts of 5 tons at a time, some of our farmers’ groups (from Busia, Teso) have supplied to Bidco.

Conclusion, recommendations and the way forward

While the ERI approach has been successful in linking smallholder farmers to domestic markets, it must also be complemented by the development of market institutions to prepare farmers to competitively access regional and international markets. Increased collaboration between research, development and business support service providers and capacity building will continue to be key ingredients in this direction. Using CIAT’s diverse approach (enabling rural innovation, three-tier model, etc.) that emphasizes agricultural commodity market development for equitable and widespread poverty alleviation, this paper contributes to the debate on how to promote crops other than the major staples and traditional export crops, which tend to be the focus of policy support in most African countries. The paper also demonstrates that collective action and value addition are potential ways of making markets work for the poor in Africa and recommends continued agricultural commodity market research, development and capacity building to enable African smallholder farmers to graduate into competitively accessing regional and international markets.

References


Improving the efficiency of African agricultural marketing systems through promoting formalised exchange infrastructure: Potential benefits, challenges and prospects

Gideon E. Onumah

Abstract

African governments and donors are increasing investment in the agricultural sector, partly in response to the widening gap in food supply to the continent’s growing population. While investment in agricultural research, extension and uptake of inputs and farm technology is expected to help raise farm output and productivity, there is growing recognition that the capacity of local and regional markets to absorb surpluses needs to be significantly enhanced if any increase is to be sustained. This paper discusses how the development of exchange infrastructure can help to improve agricultural marketing systems in Africa and boost domestic food supply. The paper reviews six cases of agricultural commodity exchanges across four regions in Africa and concludes that their performance can be substantially improved if there is investment in developing supporting institutional infrastructure such as regulated warehouse receipts systems, enforceable trade-friendly commodity standards and reliable market information systems. Also crucial are an enabling policy environment and supportive regulatory framework. To ensure that smallholder farmers benefit from the development of exchange infrastructure, it is essential that collective marketing by primary-level farmers’ organizations is actively promoted. The paper stresses that since the supportive institutional infrastructure for commodity exchanges is also fundamental to efficient marketing systems, public investment in its development can generate significant social benefits.

Introduction

The recent global food crisis has refocused attention on the need to strengthen the capacity of Sub-Saharan Africa (SSA) to feed its growing population. Its food imports bill is considerable and rising. In 1990-92 the annual food imports bill of SSA stood at US$ 16 billion but by 2004 it had reached US$ 25 billion – excluding the US$ 2 billion in food aid provided by relief agencies every year (ECA, 2007). It is projected that the continent will rely even more on food imports by 2015. Inadequate and highly variable domestic food production partly accounts for the growing frequency and severity of food crises in most parts of Africa, especially in eastern and southern Africa (Tschirley and Jayne, 2007). While per capita food production increased by 27% and 12%, respectively, in Asia and Latin America between 1980 and 1995, in sub-Saharan Africa, it actually fell by 8% during that period. Indeed, Africa is the only region where average per capita food production has been falling for the past four decades.

Civil conflict, political and economic crises, and the HIV/AIDS pandemic are among the complex range of factors responsible for food supply gaps at national and regional levels in Africa (Clover, 2003). Yields obtained by smallholder farmers, who dominate African agriculture, are comparatively low and have generally stagnated since the early 1960s. Cereal yields in Africa, for example, increased by only 29% in the 43 years between the early 1960s to early 2000s, compared to 144% and 177%, respectively, for Latin America and Asia (Staatz and Dembele, 2008). However, there is growing recognition that input-intensive programs that focus on increasing farm productivity by promoting uptake of fertilizer and improved planting materials are insufficient in the attempt to bridge the food supply and demand gap in Africa. Sustained increase in agricultural output and productivity requires major improvements in the functioning of African agricultural marketing systems. This is evident in the design of the Comprehensive Africa Agriculture Development Programme (CAADP) initiated by the New Partnership for Africa’s Development (NEPAD). Pillar II of CAADP focuses on “improving…trade-related capacities for market access”. The Alliance for a Green Revolution (AGRA), another continent-wide agricultural development initiative, appropriately recognizes that “a sustainable Green Revolution in Africa can be hedged on well-functioning markets that provide reliable outlets for farm produce while also serving as dependable sources of affordable food”.

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4Discussion of these factors is beyond the scope of this paper.
6Source: (AGRA website): http://www.agra-alliance.org/section/work/markets1
This paper discusses the potential role of exchange infrastructure in improving the functioning of agricultural marketing systems in Africa, thereby boosting domestic food supply and reducing food price variability. The next section defines exchange infrastructure, demonstrating how the associated benefits can help address some of the factors that hamper efficient food trade. The paper then identifies the prerequisites for successful development of exchange infrastructure, and reviews the performance of commodity exchanges in Africa. The paper concludes with a summary of the priority actions which African countries need to pursue in promoting viable exchange infrastructure as part of efforts to transform the performance of agricultural marketing systems.

**Description and benefits of exchange infrastructure**

**Description of exchange infrastructure**

Exchange infrastructure can be described as institutional innovations that can improve efficiency in food marketing in Africa. That is, it is perceived as a set of market institutions that foster fluid and cost-efficient trade and can, as argued by North (1990), improve the performance of agricultural markets with long-term beneficial impact on food supply and prices as producer margins increase. It consists of agricultural commodity exchanges as well as the essential physical and institutional infrastructure that guarantees delivery and payment for commodities traded. These include warehouse (or silo) receipt systems (WRS), enforceable commodity standards, reliable payment systems and market information systems (MIS), as well as the legal and regulatory framework that define the “rules of the game” for exchange trading.

A commodity exchange provides a venue, which may be physical or virtual (electronic), at which buyers and sellers are brought together to trade, usually through a group of registered brokers. Trading in this marketplace may be in physical commodities or derivatives, which are financial contracts/instruments, whose values are derived from the value of an underlying asset, which can be commodities, equities (stocks), mortgages, bonds, interest rates and exchange rates. Derivatives are usually used to reduce the risk that the value of the underlying asset will change unexpectedly. Warehouse (or silo) receipt systems, which often underpin delivery against exchange-traded contracts, involve the issue of a warehouse receipt (WR) to a named depositor as evidence that he/she has deposited a specified commodity, of stated quantity and quality, at a specified location. The holder of the receipt may pledge it to a lender (with the stored commodity being the collateral for a loan) or transfer it to a buyer (by way of a sale) (Coulter and Onumah, 2002). The warehouse operator or collateral manager, who has custody of the stocks, guarantees delivery against the receipt and should be able to make good any value lost through theft, fire or other catastrophes.

Though exchange trading begun in the US in the 19th Century, it was only in the early 1990s that many African countries showed interest in promoting agricultural commodity exchanges. Ghana, Nigeria, Kenya, South Africa, Uganda, Zambia and Zimbabwe are among African countries that attempted to establish agricultural commodity exchanges. These initiatives were endorsed by policymakers at the continental level at the Second Extraordinary Session of African Ministers of Trade held in Arusha in November 2005. The Ministers resolved that African countries should prioritize the development of exchange infrastructure as part of measures to improve commodity marketing, access to trade finance and risk management.

The focus on developing market institutions such as commodity exchanges occurred following liberalization of agricultural markets in most African countries. Prior to that, agricultural marketing systems in most African countries were characterized by pervasive government interventions (Akiyama et al., 2001). The institutional vehicles and policy framework employed by most governments to support the production and marketing of strategic food staples and export crops included pan-territorial and pan-seasonal pricing, regardless of the cost of assembling produce from particular regions; enforcement of formal commodity standards by marketing boards; sole distribution by the state of subsidized inputs to producers; and promotion of cooperatives as intermediaries in the marketing chain. In most cases, these interventions became an unsustainable fiscal burden, contributed to real decline in producer prices and failed to produce any significant increase in per capita output in food crops (Hubbard, 2003).

The policy focus shifted in the 1980s to “rolling back the state”, based on the orthodox thinking that state interventions directly or indirectly create distortions that undermine market efficiency and have to be dismantled (World Bank, 1997). Little emphasis was placed on developing institutions to help the private sector succeed in expanding its marketing activities. However, nearly two decades after the reforms were initiated, agricultural
markets in Africa remained inefficient and characterized by high food distribution margins and seasonal price variability. Though spatial marketing margins declined in the post-reform era in a number of African countries, they remained very high (Badiane et al., 1997). Temporal marketing margins are similarly high, ranging between 32% in Malawi and over 100% in Ghana (Coulter and Poulton, 2001). Consequently, producer margins are substantially squeezed, effectively stymieing investment in productivity-enhancement in Africa’s farm sector. This is largely attributable to a myriad of constraints, including high transaction costs, imperfect information and incomplete markets that characterize these markets. Some of the constraints can be addressed with the development of viable agricultural commodity exchanges and related institutional infrastructure as illustrated in the discussions in the next sub-section.

Potential benefits of exchange infrastructure
Reducing transaction costs through exchange trading – High transaction costs constitute a major barrier to the development of efficient trade in agricultural commodities in Africa. In a study of Benin and Malawi, Fafchamps and Gabre-Madhin (2006) find that the largest transaction costs for the observed traders are associated with search and transportation. The cost of assembling produce tends to be high as a result of atomized production over wide geographical areas. Transactors are often poorly informed – buyers have limited information about inventories held by rural producers who also lack timely and reliable access to price information from local or regional markets. The absence of formal commodity standards for quality as well as weights and measures creates uncertainty about the quality and quantity attributes of commodities being traded. Hence, physical sampling is the norm in most rural transactions and contributes to raising the cost of transacting. Formal contract enforcement mechanisms are also weak (Fafchamps, 1996). Hence, the rural trade thrives where trust has been developed on the basis of repeat transactions or informal relationships, creating a significant barrier to entry in large-scale food trade and limiting participation by smallholders in the evolving modern marketing systems or in the sub-regional commodity trade.

Exchange trading generally saves time and cost of transacting as well as reduces counterparty risks by guaranteeing payment for and delivery of traded commodities. It reduces the cost of sourcing produce for traders and processors, while lowering the cost of accessing markets for farmers, especially for premium quality produce. It avoids the high-cost and time-intensive process of physical sampling of goods before purchase, which is predominant in the informal agricultural trade in the country. This is because the quality and quantity of the traded product is assured, thus making “sight-unseen” trade possible, implying sellers can sell to buyers in a wider geographical area than their immediate location. For instance, a farmer in a rural location can sell his/her deposited crop to traders in regional markets without the need for any physical contact, making the trade more competitive because many more traders can participate.

The guarantee of delivery by the exchange, based on guarantees by warehouse operators, reduces the risk of non-performance of trade contracts. Sellers are also assured of payment for the commodity sold, with systems being in place to minimize the risk of default by buyers, especially when the market moves against them. The greater security in trade transactions provided, leads to significantly lower cost (including time lost) associated with contract enforcement, especially where litigation is time-consuming and expensive.

Improved storage services will reduce post-harvest losses – Among factors limiting temporal arbitrage, which also contribute to high seasonal price variability, is lack of efficient storage facilities. During the pre-liberalization period, where the state played a major role in food marketing, especially of staple grains, considerable investment in storage infrastructure was made by donors and African governments. These facilities have sometimes remained under public-sector control long after the role of parastatal marketing boards was either abolished or scaled down substantially. Private-sector investment in storage infrastructure is often concentrated in urban areas and tends to support import/export trade rather than the domestic food trade. Storage management capacity is also highly variable in many countries and, as a consequence, storage in food surplus-producing areas is largely undertaken by ill-equipped farmers, resulting in very high post-harvest losses.

The WRS that underpin delivery systems for commodity exchanges encourage storage of agricultural commodities in well-run facilities. This reduces storage losses and can therefore help

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3For instance, in Ghana, the average weight of a “maxi-bag” of maize differs from location to location. Zambia has a more formalized maize marketing system, but grain sampling is usually by sight and highly subjective. This increases the risk of cheating on weights and quality, and makes physical sampling imperative.
to significantly reduce post-harvest losses, which in many African countries is estimated at well over 10% of output. The risk of loss of value to holders of warehouse receipts is further minimized as operators are required to insure against storage losses. The cost of storage is also likely to be lower, especially for fungible commodities such as grains. These can be stored together (commingled) if they meet set grading standards, making it possible for a number of depositors to jointly use available storage space.

**Liquidity in the agricultural trade can be enhanced** – Lack of suitable storage facilities as well as limited access to inventory credit hampers intra- and inter-seasonal stockholding. While the capacity of traders to store tends to be limited, producers are discouraged from holding inventories as they are compelled to sell the bulk of their output immediately after harvest, when prices are very low, primarily to meet the cash needs of farm households. The stabilizing function that traders play in developed commodity markets through temporal and spatial arbitrage is severely limited in African agricultural markets (Fafchamps and Gabre-Madhin, 2006).

Liquidity in agricultural trade can be enhanced if lenders’ aversion to the provision of inventory finance is addressed through the development of exchange infrastructure. For instance, a credible WRS that underpins a viable commodity exchange allows stored commodities to be used as collateral for loans, thereby making inventory finance more readily available. Alternative forms of financing – mainly balance sheet financing and lending against immovable property in prime urban locations, which predominate in most African countries – exclude many entrepreneurs, especially those in agriculture, from the credit market. Structured finance based on WRS tends not to discriminate against normally disadvantaged borrowers if they are able to utilize the services of licensed warehouse operators. Exchange trading offers a transparent and more reliable means by which lenders can liquidate collateralized commodities and so make financing backed by inventory more attractive. Furthermore, as an exchange matures from a spot market into offering various risk management instruments, including futures and options contracts, lenders are able to use such instruments to hedge price risks. By so doing, they reduce credit risks, leading to lower cost of borrowing.

Access to inventory financing enables producers to defer sales during the harvest season, when prices are low, and ride the price curve to gain from seasonal price increases (see Box 1). It also allows traders and processors to build up inventories and overcome limitations to scaling up due to lack of capital or cash flow difficulties. Another benefit is more moderate seasonal variability in the supply and prices of agricultural commodities. This will benefit consumers, who will pay relatively less for food during the lean season while producer prices at harvest will be relatively higher.

**Box 1: WRS pilot for maize in Zambia**

A warehouse receipt system was piloted in Zambia for grains under a project funded by the Common Fund for Commodities (CFC) and implemented by the Natural Resources Institute (NRI). The project succeeded in creating the foundations for a thriving WRS, which was accessible to both commercial and smallholder farmers. Implementation of the WRS project was launched in 2000 and its pilot use occurred in the 2003/04 season. It was most successful during the 2004/05 season, when the following outcome was achieved:

- Four certified warehouse operators (total capacity 105,000 tonnes)
- Grain deposits of over 65,900 tons (2,100 tons from smallholder farmer groups)
- Receipted stocks financed at an average advance rate of 78.6%
- Participating banks: Inter-market Discount House, Barclays, Standard Chartered and Stanbic Bank

Though policy uncertainty has hampered growth of receipting activity in Zambia, the pilot successfully demonstrated that it was possible for smallholders to use such a system to trade with large processors and to obtain finance from lead banks such as Barclays Bank.

Source: NRI Reports.
Information asymmetry and policy uncertainty can be reduced—Information asymmetry between smallholder producers and traders in the rural trade as well as severe household liquidity constraints often skews bargaining power in favor of the latter (traders). It is for this reason that donors and governments invested in agricultural market information systems (MIS) in many African countries. Exchange trading improves the collection and dissemination of market information to players. Prices on the exchange, which are discovered through a transparent process, are widely disseminated. Brokers, who facilitate trade and provide market advice to their clients, receive and analyze price-sensitive market information, thereby assisting buyers and sellers in making trade decisions. Furthermore, the exchange offers a competitive trading platform by bringing together a large number of sellers and buyers to trade on the basis of reliable information. The bargaining position of producers is thus strengthened because information dissemination is not de-linked from access to remunerative market opportunities as tends to be the case with most government and donor-funded MIS.

Uncertainty regarding government policy on food markets—for example delivering subsidized grains, imposing export bans or ad hoc waiver of duties on imported food in response short-term price increase—discourages traders from holding significant stocks while making inventory financing even more risky. Like private players, governments and relief agencies can use price-risk management instruments offered by exchanges to hedge their positions on grain markets, and thereby bring greater stability to the net prices at which they are traded in the market. The Malawi case cited in Box 2 illustrates this. Again, governments and relief agencies such as the World Food Programme can also use the WRS to cost-effectively procure and store food from domestic and regional markets and manage strategic food reserves (Coulter, Walker and Hodges, 2007).

Box 2: Malawi uses options to manage price of imported maize

Governments can use options to better manage supplies and prices within the domestic market for staple foods. Relief agencies can similarly use these instruments traded on the exchange or over-the-counter to insure against a surge in the price of locally procured grain. An example of the use of this instrument was by the Government of Malawi (GOM). In September 2005, the GOM signed an options contract with Standard Bank of South Africa giving it the right, but not the obligation, to buy additional maize at a price fixed at the time the contract was signed. The contract allowed for the purchase of a maximum of 60,000 tons of maize at a cost of approximately US$ 18 million—enough to meet the food gap if donor and private-sector commercial imports did not reach anticipated levels. The UK Department for International Development (DFID) provided the financing to pay the options premium up-front, and the World Bank provided technical support. The options contract provided the Government with a mechanism to trigger additional imports at short notice, put a price cap on the cost of maize from South Africa and provided protection against the risk that prices would move higher. Finally, agreeing to an “over-the-counter” contract meant that the cost included delivery to Malawi, reducing uncertainty over transport prices. Previously, examination of the scope for using risk-management tools such as futures and options to help manage price volatility in food-insecure countries was limited by a concern about basis risk: the risk that prices on the exchange would not move in a correlated way with prices at the local level, for example in a different country often geographically far away from the exchange. This risk was removed with the over-the-counter call option contract used by the Government of Malawi since it was structured to include price protection on the South Africa Futures Exchange (SAFEX) white maize futures price and for transport to Malawi.

Source: Slater and Dana (2006)
Exchange infrastructure is not a cure-all

High transport costs, which contribute to the rather high marketing costs in most African countries, are a problem that cannot be addressed by the development of exchange infrastructure per se. Inland transport costs are particularly high and sometimes exceed ocean freight and insurance costs for imports (Coulter and Poulton, 2001). Poor rural transport infrastructure is one of the contributory factors. Quite often investment in rail and road transport infrastructure is skewed in favor of urban as well as leading mining and industrial communities. Rural food-surplus areas often lack good road and rail networks, a situation that discourages investment in haulage transport facilities in rural communities. It is quite common to see produce assemblers, who are the first link in the distribution chain, using passenger transport vehicles in bulking produce for the main wholesale markets. Most of the available vehicles are also ill-maintained and over-loaded, leading to high transit losses, the cost of which is passed onto consumers (Teravaninthorn and Raballand, 2009).

Investing in improved rural transport can enhance rural food trade and have beneficial impacts on the rural economy. As an illustration, Limao and Venables (2001) conclude on the basis of an empirical study that a 10% drop in transport cost as a result of improved transport infrastructure is likely generate a 25% increase in trade and drive down distribution margins to the benefit of producers and consumers. The imposition of levies by district authorities and checkpoints mounted by the police also increase the cost of transporting agricultural produce in Africa.

Review of agricultural commodity exchanges in Africa

Though many African countries have shown interest in promoting agricultural commodity exchanges, most of the exchanges have been unable to sustain spot trading, much less trading in futures and other derivatives as noted by UNCTAD (2007). The major exceptions in Africa are the Zimbabwe Agricultural Commodities Exchange (ZIMACE) and JSE/SAFEX (formerly South Africa Futures Exchange or SAFEX) in South Africa. ZIMACE successfully traded in grains from 1994 until 2001 when it was abolished as the Government of Zimbabwe intervened in the market to control the marketing of staple grains. To understand why agricultural commodity exchanges have not fared well in Africa, we review their performance against the backdrop of the key prerequisites for successful exchanges.

Prerequisites for viable agricultural commodity exchanges

Based on the case of JSE/SAFEX, Figure 1 presents an illustrative summary of the basic pillars for a successful commodity exchange. Transparent trading platforms are critical in ensuring competitive trading. Electronic trading platforms are increasingly replacing the traditional “open outcry” systems used by most of the established commodity exchanges. Advances in information technology (IT) have made it possible for countries such as South Africa to build local capacity to develop and maintain electronic trading platforms. Such a system is currently being used by JSE/SAFEX and by the Uganda Commodity Exchange.

The emergence of electronic trading platforms has made it possible for investors to route their orders directly to an exchange but brokers continue to play their traditional role in facilitating exchange transactions. This is because their knowledge of markets and expertise in processing market information allows them to offer investment advice to their clients (who are, however, responsible for their decisions). They also conduct and oversee each transaction – from placement and execution to clearance – on behalf of their clients. Some brokers may even be given permission by their clients to act on their behalf at the broker’s own discretion.

In many African countries stock exchanges preceded commodity exchanges. Though the markets for the equities and government debt instruments that are traded on the stock exchanges tend to be rather thin, the advent of stock markets has led to the emergence of a cadre of brokers who can be trained to offer services on commodity exchanges. Indeed, in Zambia, Uganda and Ghana, brokers on the stock exchanges have been keen to trade on domestic commodity exchanges if they are established, mainly because of the opportunity to expand their trading portfolios.

A credible clearing and settlement system is important in assuring payment to sellers. This service is often provided by clearing banks that are members of the commodity exchange. Financial liberalization and adoption of pretty tight financial regulations in many African countries has led to the emergence of competitive and healthy banks as well as non-bank financial institutions (Fosu et al., 2003). It is therefore feasible for credible banks in these countries to offer clearing and settlement systems to underpin trade in commodities and derivatives.
The rules and procedures that guide contracting, contract enforcement and dispute resolution are crucial in assuring payment and guaranteeing delivery of traded commodities. These are important in engendering trust in an exchange. However, establishing a credible delivery system can be quite challenging. A robustly regulated and trusted WRS appears to hold the key to success in assuring delivery. However, in Africa, the most common main types of WRS are unregulated commercial WRS or NGO/donor-sponsored systems.

An unregulated commercial WRS is a legal/formal system of inventory collateralization, in that the provision of services as well as the rights and obligations of counterparties are based on existing contract laws. Aggrieved parties can seek redress through the courts, but there is no oversight by an independent regulatory agency (Coulter and Onumah, 2002). Under this system collateral management firms set up bespoke tripartite "collateral management agreements" (CMAs) between a bank, a borrower and a collateral manager. Warehouse receipts are issued directly to the financing bank, not to the depositor, and are non-transferable. Hence, they cannot be used as delivery instruments against contracts, i.e., for trade, but only to secure bank credit. The system has proved beneficial in easing access to finance for import and export trade but rarely for the domestic trade, except where the depositor is a large processor or major trading company. Furthermore, access tends to be limited to large operators, who own or can rent entire warehouses or silos, and can afford fees costing thousands of US dollars per month.

The unregulated inventory credit system9 is often organized around targeted farmer groups, who are assured access through the use of warehouses with very low storage capacity (some as low as 20 tons) and are located in villages. The designated warehouses are usually managed by participating farmers’ groups. In cases where relatively larger warehouses (with storage capacity of up to about 1,000 tons) are used, collateral managers may be appointed, but the collateral management fees and storage fees tend to be heavily subsidized by the sponsoring donor or NGO. Financing is often by microfinance institutions (MFI) or agricultural development banks and is secured against the non-transferable receipt issued and a guarantee that may be up to 100% of the value of the credit advanced. Though this system proved beneficial in easing access to inventory credit by smallholder farmers, its sustainability is often difficult to assure and the warehouse receipts issued cannot support exchange transactions because they are not transferable.

The regulated WRS model, which is illustrated in Figure 2, involves an independent regulator who is responsible for licensing/certifying warehouse operators as custodians of collateralized stocks and ensuring that they comply with criteria set in relevant laws and regulations. They also regulate the issue

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*Source: Author (pers. comm. with JSE/SAFEX officials and other players).
*9Ghana was one of the first African countries to pioneer the unregulated inventory credit system under a project implemented by TechnoServe. It has been widely promoted in the Sahel Region as well as in some eastern and southern African countries.
of standardized warehouse receipts to minimize the risk of fraud and oversee the operations of warehouse operators, including carrying out unannounced stock and quality verifications. Licensed operators offer “public” warehousing services, implying they can store commodities on behalf of multiple depositors (of all sizes) in a single warehouse or site. The receipts issued may be transferable and negotiable, depending on the enabling legislation. Licensed warehouse operators may include international as well as local inspection companies, and processing companies such as ginneries.

The licensed/certified warehouse operator issues WR representing goods weighed and graded (stating quality and quantity on the receipt).

Depositor can sell directly to buyers or through the commodities exchange – with the warehouse operator guaranteeing delivery of specified quality and quantity against the WR.

Where finance is needed, depositor pledges WR to lender and later arranges sale either through the commodities exchange or directly with a buyer who makes direct payment to the lender to obtain the WR that allows him to take possession of the underlying commodity.

In case of default, lender can sell WR through the exchange – the financing contract should allow lender to liquidate WR without litigation.

Figure 2: Illustration of a regulated Warehouse Receipt System
**Africa’s agricultural commodity exchanges**

This sub-section focuses on a review of the performance of agricultural commodity exchanges established in six countries in central, western, eastern and southern Africa.

The Ethiopia Commodity Exchange (ECX) is the most recent spot/cash exchange in Africa, which was launched in 2007. It is owned by the Government of Ethiopia, which funded the initial capitalization of about US$ 20 million, with some contribution by external partners. The government also underwrites all performance risks. However, ECX is run by a board representing farmer cooperatives, the state-owned grain trading enterprise and trading members. The trading platform involves the use of open outcry, but an electronic trading system is being developed and is expected to be launched in the near future. The main commodities traded by ECX are maize (white and mixed), wheat (hard and soft), sesame and beans (white pea beans and red kidney beans). It is expected that teff (a major Ethiopian staple) and coffee will be traded on the exchange in the near future. The standard ECX contracts specify the following:

- Commodity – type and grade;
- Standard lot size;
- Price quotation and contract quote basis (e.g., cost and freight included);
- Mode of payment and delivery;
- Delivery period;
- Weight or quality or other tolerance from agreed terms;
- Arbitration terms in case of dispute; and
- Any other terms agreed with the exchange

Buyers and sellers generally have to agree on the price and quantity of the standard lots. The standard lot size is five tons—tailored to the current average load per small truck in rural Ethiopia and to ensure broad participation, including small-scale market players. All contracts are quoted as “arrived Addis Ababa” and a locational differential (discount or premium) applied based on transport tariffs from Addis Ababa to the actual delivery location. ECX regularly updates the transport differentials and makes this information known in advance of a trading session. Clearing and settlement are handled by three partner settlement banks and the contracts are for immediate delivery of the physical commodities (it is anticipated that ECX will in future introduce trading in futures contracts). The ECX owns and operates a network of 10 warehouses spread across six main production areas in the country as well as additional 20 remote terminal centers in major market centers. These warehouses were leased from the state-owned Ethiopian Grain Trading Enterprise (EGTE). The exchange enforces warehouse standards.

The ECX operates an electronic warehouse receipt (EWR) system controlled by the Exchange Central Depository, which is the sole entity authorized to issue EWRs, transfer legal title and cancel receipts. The EWR represents legal title and is transferable and negotiable on the exchange. It may be used for purposes of securing collateralized finance and may, upon request, be materialized into a paper receipt.

It is apparent from the brief description above that the ECX has all the basic requirements for operating a commodity exchange. By September 2009, the ECX had recorded trade representing 150,000 tons of commodities held in 14 of its designated warehouses. Coffee accounted for over 90% of the commodities traded, valued at about US$ 300 million. Cooperatives representing almost 850,000 farmers accounted for 12% of the trade in coffee on the ECX. It has to be noted, however, that 95% of Ethiopian coffee is produced by smallholder farmers. Government policy requiring coffee for the export market to be traded through the ECX contributed to the success of the exchange in attracting substantial volumes of the commodity. It is reported that exchange trade has impacted positively on the quality of Ethiopia’s coffee exports while also increasing returns to farmers. The ECX has launched a warehouse receipt-financing scheme, with support from the International Finance Corporation. This is expected to improve access to agricultural finance while increasing the volume of stocks held in the formal sector and available for trading through the exchange. Staple grains, which are produced predominantly by smallholder farmers, are being particularly targeted.

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10 Data and information based on presentation by ECX official at the workshop on improving the functioning of commodity markets in eastern and southern Africa. 30 September - 2 October 2009. Lusaka, Zambia.

11 These reports are yet to be validated by any empirical studies.
The Uganda Commodity Exchange (UCE) was incorporated in 1998 by four founding shareholders led by the Uganda Cooperative Alliance (UCA). The other founding members were the Uganda Coffee Trade Federation, the Uganda Farmers’ Federation and the Uganda Export Promotion Board. They were later joined by other shareholders, including UNEX (a private coffee trading firm in which UCA has interest), Olam Uganda Limited (a multinational coffee trader), NGOs (Africa 2000 Network and Satnet) and three cooperative societies. The Government of Uganda had no equity stake in the UCE. However, through its Department of Cooperatives under the Ministry of Trade, Tourism and Industry, the Government supported the UCE, funding its operating costs (including staff remuneration) while it was not financially sustainable. The Government also assisted the UCE in securing funding from the EC for restructuring its operations to enable it to achieve financial sustainability. The board of the UCE is, however, dominated by private interests.

The main commodities traded include coffee, maize, sesame, beans, soybeans and rice. The minimum lot size was set at 10 tons. Unlike the ECX, the UCE operated until 2006 without a network of warehouses and trading was not done on the basis of certified commodities at designated locations. No formal WRS was in place and verification of the quality and quantity of commodities offered for sale on the exchange was typically by means of on-site physical sampling by personnel of the exchange. This process was costly and unreliable. Samples were sometimes not representative of the stocks offered and quantities offered could be sold while officials of the exchange were busy contacting potential buyers. The occurrence of non-performance, particularly by sellers, undermined confidence in the UCE, leading to very low trading volumes [only 11 contracts were traded between March 2002 and June 2004 (Onumah and Linton, 2004)].

With support from the EC, the UCE is being restructured to enhance its prospects of viability. As part of this process, it is building on a WRS developed for cotton and coffee under a project funded by the Common Fund for Commodities (CFC). Under the CFC project, the Government promulgated warehouse legislation recognizing warehouse receipts as negotiable documents of title and also instituted regulatory oversight of the issuing of warehouse receipts. The regulatory authority has been delegated by the Minister of Trade to the UCE, which is therefore responsible for licensing warehouses and operators, collateral managers and the issuing of negotiable warehouse receipts. An electronic receipt system and trading platform have been developed for the exchange. The restructuring process, which has encompassed the development of the basic prerequisites for the UCE, is yet to be completed and therefore the UCE is yet to achieve operational viability.

The Abuja Securities and Commodity Exchange (ASCE) is a spot/cash exchange promoted and largely funded by the Government of Nigeria which provided office facilities, vehicles and other office equipment and funds for recurrent expenditures, including remuneration of its rather large management structure. As was the case of UCE prior to 2006, the exchange operates a trading system that lacks a credible delivery mechanism. Not surprisingly, therefore, it has struggled to achieve significant volumes of trade. Between July 2006 and the first quarter of 2009, the ASCE traded a total 2,874 tons of sorghum, maize, cowpea, millet and soybeans valued at just under US$ 400,00012. The volume of commodities traded represents a very tiny fraction (0.12%) of annual demand from formal buyers (i.e., industrial end-users) for cocoa and the commodities listed above13.

The Kenya Agricultural Commodity Exchange (KACE) is another spot/cash exchange. It was initiated by a private entrepreneur but has been supported by various donors, including USAID, Rockefeller Foundation, the Hans Seidal Foundation of Germany and CTA in the Netherlands. However, it is yet to trade sufficient volumes to assure financial sustainability. To date, its major achievements have been in collecting and disseminating market information, as well as operating an electronic bulletin board through which sellers and buyers “advertise” commodities they intend to sell or buy. KACE has not instituted any standards pertaining to grades and minimum lot sizes and has no designated warehouses as licensed delivery locations. Its poor performance has principally been attributed to the missing prerequisites. It has only been successful as an electronic information platform and therefore cannot appropriately be described as a commodity exchange.

To remedy the situation, in late 2007 the East African Grain Council (EAGC), with support from USAID, launched a program to develop a WRS for grains in Kenya. Implementation of the WRS,
centered in the grain surplus-producing region of Western Kenya, was disrupted by the recent post-election conflict in Kenya. It is expected that success in developing the WRS will see the emergence of one of the key pillars that will help transform the prospects of KACE or a successor exchange that the EAGC and other stakeholders may promote.

The Zimbabwe Agricultural Commodity Exchange (ZIMACE) was the most successful spot/cash agricultural commodities exchange in Africa until 2004, when the Government of Zimbabwe introduced strict controls over grain trading (ZIMACE was subsequently abolished). ZIMACE was incorporated in 1994 and its member-shareholders were mainly producer associations, millers, major grain traders and the state-owned Grain Marketing Board (GMB). It was run as a private operation funded by fees from members and commissions. The main commodities traded were maize, wheat and soybeans. Daily trading sessions were held on the floor of the exchange, using open outcry and with trading through appointed brokers. Trading contracts were similar to those used by the ECX. The designated delivery locations were warehouses belonging to the GMB, which met specified warehouse standards. Warehouse inspection was undertaken on behalf of ZIMACE by appointed inspection companies, notably ITS Socotec. Standard ZIMACE warehouse receipts were issued for deposited commodities and formed the basis of trading on the exchange. By 2001, the value of contracts traded by ZIMACE was about US$ 500 million – the success primarily due to the integrity of the underlying systems that guaranteed delivery and payment. Despite its apparent success, the exchange was perceived as a “club” for large-scale producers and their counterparts in industry – a perception that provided justification for its abolition in 2004.

The South Africa Futures Exchange (SAFEX) was established by private-sector players in 1996, just after the agricultural marketing system was liberalized by the Government of South Africa. It was subsequently taken over by JSE Securities, which operates the stock exchange, becoming better known as JSE/SAFEX. Liberalization involved repealing a previous Act that allowed for single channel marketing systems, and promulgating a new Act that limited Government intervention in agricultural markets to provision of market information and support for market-related research. The Government also encouraged advocacy by the private-sector organizations. Under the new marketing system, producers deposit grain with silo operators, who issue silo certificates (SC) confirming the deposit of grain of stated quality and quantity by the named depositor at the specified silo. The silo operators are certified by JSE/SAFEX, which oversees their operations to protect the interest of depositors and bona fide parties to whom ownership of the underlying commodity is transferred. Silo operators can either issue SCs in their own name, or issue the more widely used SAFEX receipts.

Most large-scale producers sell their grains through JSE/SAFEX (usually by appointing brokers to sell the SCs representing the crop). There are cases where some producers sell directly to processors, but these are relatively few and declining compared to sale through the exchange. The benchmark price in such cases is usually the JSE/SAFEX price. Where producers wish to defer sale, they can obtain finance against the SC. In such cases, the borrower is usually required to hedge against any downside price risks using futures and options traded on the exchange.

As a result of the availability of price risk management instruments developed on the basis of the receipt system, banks have been able to structure production finance, requiring borrowers to deposit their produce with certified silos. Their track record in deposits is used in determining their output, against which finance is provided. Buyers of SCs include processors, who may take delivery of the underlying commodity on presentation to silo operators or to investors. The investors participate in the market primarily to make gains from anticipated price movements, but play a crucial role of making the market liquid and enabling risk sharing.

The main commodities traded by JSE/SAFEX are maize (white and yellow), wheat, sunflower seeds and soybeans. The standard lot sizes per contracts are 100 tons of maize, 50 tons each of wheat and sunflower seeds and 25 tons of soybeans. On average, JSE/SAFEX trades futures and options contracts representing about 200,000 tons of maize per day. Only a small and continually declining portion of these contracts end with physical delivery because the bulk of the trading is for hedging. This is despite the fact that all products traded can be physically delivered at expiry in fulfillment of a futures contract. The SCs were initially paper documents, but the sheer load of paper documentation and risk of loss led to the adoption of an electronic receipt system. Most depositors obtain inventory finance secured with the SCs.
Reviewing the market reforms in 2002, South Africa’s National Department of Agriculture reported that the successful transition from a state-controlled single marketing channel to a liberal marketing system could be attributed partly to the successful development of JSE/SAFEX and related institutional infrastructure (illustrated in Figure 1 above). However, it was acknowledged that government commitment to the development of the free market in agricultural commodities had been instrumental in engendering private-sector confidence in the market. This commitment was tested in 2000 when the government resisted pressure from producers to provide price supports when grain prices collapsed as a result of a glut. Again in 2001 and 2002 the government refused to intervene to force down grain prices that had risen as a result of significant domestic and regional supply deficits. The National Agricultural Marketing Council (NAMC), which is a representative body for key private stakeholders in the agricultural sector, has been instrumental in facilitating policy dialogue and managing the risk of policy uncertainty. The Council also collaborates with the Government of South Africa in raising funds through levies on traded commodities. The funds are to finance sector-related research and market information collection and dissemination.

Scale diseconomies and advocacy for regional exchanges

Low volumes of marketable surplus of commodities can undermine the viability of agricultural commodity exchanges. It is for this reason that it is sometimes argued that Africa should pursue the development of regional or continental exchanges. African Ministers of Trade concurred with this suggestion at their summit in Arusha in November 2005. This objective may be desirable as regional or pan-African exchanges can enjoy the benefit of scale economies that will assure viability and liquidity. There may also be better prospects for attracting global players to regional exchanges than to national exchanges with rather thin markets.

However, pursuing this option is fraught with major challenges. Harmonization of commodity standards, sanitary and phytosanitary regulations, as well as storage and trading regulations is required to make this feasible. Eastern and southern African governments have been working on these issues as part of the “Maize without Borders” initiative supported by the USAID-funded Regional Agricultural and Trade Expansion (RATES) program. Progress has been rather slow. Equally important in promoting regional commodity exchanges is the need to lower policy barriers to trade, at least at regional levels. In most regions of Africa, the regional economic communities (e.g., ECOWAS and COMESA) have clear protocols to facilitate regional trade. However, compliance with these protocols is often compromised, especially in the food trade, when national governments perceive regional trade as a drain on domestic food supply during seasons when there is a short crop. Credible commitments by governments to foster regional trade appear, therefore, to be dependent on enhanced capacity to manage short-term food crisis.

Other policy-related bottlenecks that need to be reduced in promoting regional or pan-African exchanges include restrictive currency exchange regulations and macroeconomic instability. Reducing existing natural transport barriers to lower the cost of transacting between players across regions is also essential. On the basis of the foregoing, it appears that in the short term, African governments may be better off focusing on building national institutions rather than the much tougher option of regional and/or pan-African exchanges. This does not, however, imply abandoning efforts to remove natural, technical and policy bottlenecks that hamper trade across regions.

Conclusions and priority actions in promoting exchanges

Driving agricultural output and productivity growth is back to the top of the development agenda in Africa. Based on the CAADP framework, African governments and donors have pledged significant investment in agricultural research, extension and the uptake of inputs and farm technology to increase output and productivity. However, there is growing recognition that production expansion will be difficult to sustain if the capacity of local and regional markets to absorb surpluses is not significantly enhanced. This is because the highly inelastic demand for most agricultural produce tends to result in precipitous price plunges when local markets are unable to absorb surplus output.

The discussions in this paper illustrate that exchange infrastructure can potentially enable African countries to simultaneously address many of the marketing and financing constraints which hamper productivity and output growth in the farm sector. As market institutions, exchange infrastructure can lower transaction costs, thereby facilitating spatial and temporal arbitrage that will contribute better producer incentives and therefore better prospects for raising farm productivity and food
production in Africa. To assess whether the identified potential benefits have been realized in any African country, we reviewed agricultural commodity exchanges in six African countries. It is apparent from the review that most of the exchanges are struggling to achieve significant trading volumes. The ECX in Ethiopia has recorded appreciable trading volumes in coffee but not in the major food staples. With the exception of JSE/SAFEX, none of the exchanges has advanced beyond spot/cash trading into futures markets that offer price-risk management instruments. The review further showed that this rather disappointing performance is due to the fact that some of the prerequisites for successful exchanges are either missing or underdeveloped.

Prominent among the prerequisites is a trusted WRS under which transferable warehouse receipts can be issued to back trade contracts, as well as secure inventory finance. Unregulated CMA-based receipts systems, which are commonly used in Africa to secure finance for the import and export trade, cannot be used to underpin exchange trading because the receipts are not legally transferable. For similar reasons the targeted inventory credit schemes, which are usually favored by donors and NGOs, may have the advantage of being directly accessible by smallholder farmers, but the receipts issued cannot be used as delivery instruments for an exchange. What is required is a robustly regulated WRS, which is also widely accessible. Legislative intervention represents a quick means by which transferability or negotiability of warehouse receipts may be assured. This option has been adopted in Tanzania and Uganda. However, their experience also shows the importance of the regulator-licensed warehouses being perceived by all parties as strong and unbiased.

A network of well-run warehouses constitutes the spine around which the WRS can be developed. Currently, in many African countries the bulk of private storage infrastructure is concentrated in urban areas, and they mainly service the import and export trade. Storage capacity in the food surplus-producing areas is very limited and mainly owned by the state – following investments in the 1960-70s under various donor-supported agricultural marketing initiatives that focused on strengthening the capacity of the parastatal marketing boards. Storage in the state-owned storage facilities has been declining largely because of a lack of credibility in public storage agencies. Zambia resolved this conundrum by allowing private operators to lease state-owned warehouses and silos through a transparent bidding process. Though the facilities remain in public ownership, the operation is by credible private parties operating in a competitive market and the services are available to all players in the agricultural sector.

Other important institutional infrastructure that supports viable commodity exchanges is trade-friendly commodity standards that minimize storage losses and foster trade-by-description as occurs on exchanges. Many governments in Africa, often with donor support, have invested in the development of market information systems (MIS), which are necessary in ensuring that market players are well-informed. In most cases, the MIS has been difficult to sustain after donor support ended and the quality of information has suffered as a result of delays in collection and processing of market data. Sustainable MIS models need to be developed. An example is the South African Grain Information Service (SAGIS), which is responsible for disseminating price data and information on supply and demand, including crop forecasts. SAGIS is funded partly by levies paid by stakeholders in the agricultural sector.

Equity investment by governments and donors in establishing national agricultural commodity exchanges in Ethiopia, Nigeria and Uganda tends to significantly dwarf private contributions. It is our view that the focus of public and donor investment should be on the development of the institutional infrastructure that we have identified above as being critical to the success of an exchange. It has to be emphasized, as noted by Rashid et al. (2008), that such institutional infrastructure is also fundamental to the development of efficient marketing systems. Hence, whether or not a country intends to establish a commodity exchange, investing in their development can generate significant social benefits. The lessons from the cases reviewed in this paper also point to the need for governments to credibly commit to creating and maintaining a policy and regulatory environment that is supportive of the operations of an exchange and efficient free markets in general. It is essential in particular to avoid policy uncertainties that inhibit private investment in commodity markets. One means of assuring this is to create public-private policy forums, such as the EAGC in Kenya and NAMC in South Africa, to provide platforms for effective policy dialogue.

A final – and critically important – issue is the challenge posed by the dominance of smallholder farmers in Africa’s agricultural
production system. The low marketable surplus produced by smallholder households makes it uneconomic for them to directly access modern market institutions and remunerative markets. This is one of the main reasons why it has not been possible for smallholder producers in South Africa to utilize marketing facilities offered by JSE/SAFEX to any significant extent. The same can be said of access by smallholder farmers in Zimbabwe regarding access to ZIMACE. However, as has occurred in Tanzania and Zambia, strong farmer organizations can facilitate the use of these systems by smallholders for purposes of collective marketing and related financing opportunities. Onumah et al. (2008) document key lessons learned by these countries, demonstrating the need to focus capacity building for collective marketing at the primary or grassroots level, rather than at secondary or tertiary levels where attention tends to be concentrated more on policy advocacy.

References


Collective action for smallholder market access: Evidence and implications for Africa

Helen Markelova and Esther Mwangi

Abstract

It is widely acknowledged that the involvement of small farmers in markets can contribute to higher productivity and income growth, which in turn can enhance food security, poverty reduction efforts, and overall economic growth. In Africa, as in other parts of the developing world, agricultural production systems and their participants face significant challenges as a result of changing economic, environmental, and sociopolitical contexts. New dynamics in the global agricultural economy, such as the growth of supermarkets, are providing smallholders with both new opportunities and new constraints to participating in and benefiting from market exchanges. Collective action in form of producer groups can enable African smallholders to take advantage of new value chains and deal with existing market imperfections. However, certain conditions must be in place to create and sustain incentives for farmers to organize around marketing. Experiences from collective action in natural resource management (NRM) have shown that the types of markets and products, characteristics of user groups, institutional arrangements, and external environments need to be considered in order to determine the effectiveness and sustainability of collective marketing for smallholders. This paper applies the lessons from collective action in NRM to marketing, using existing case studies of producer groups in Africa, and offers policy recommendations on the factors that contribute to the success of collective marketing efforts.

Introduction

Challenges for African agriculture

The issues concerning small agricultural producers feature prominently in the global discussions about poverty reduction as the majority of the world’s poor belong to such households. It is widely acknowledged that the involvement of small farmers in markets can contribute to higher productivity and income growth, which in turn can enhance food security, poverty reduction efforts, and overall economic growth (Fafchamps, 2005; Bernard and Spielman, 2009; Barrett, 2008). In sub-Saharan Africa, this issue becomes even more acute, since two-thirds of the population live in rural areas and depend on small-scale farming for their livelihoods, which so far has failed to produce enough food for consumption or generate sufficient incomes. At the same time, agriculture constitutes 30-50% of national incomes and has the potential to be the driver of economic growth on the continent (Teonniessen et al., 2008). To achieve this goal, there is a clear need not only to increase the productivity of African smallholders, but also to effectively link them with markets.

However, in Africa, as in other parts of the developing world, agricultural production systems and their participants are facing significant challenges in the face of changing economic, environmental, and sociopolitical backgrounds. Unlike their Asian counterparts, African rural producers did not benefit from the first Green Revolution in the 1960s and 1970s, mostly due to the fact that governments in Africa did not provide the complementary support needed, such as infrastructure investments and input subsidies, for the agricultural technologies to succeed and for rural markets to develop (Teonniessen et al., 2008). Structural adjustment programs and trade liberalization efforts, whether incomplete or insufficient, failed to move African smallholders out of a subsistence mode, especially in areas removed from market centers (Barrett, 2008; Teonniessen et al., 2008). In addition to the failed and/or ineffective agricultural policies and programs by governments and international financial institutions, the agricultural sector in Africa has been negatively affected by changing environmental conditions, such as increasingly unpredictable weather patterns and diminishing availability of productive land and water resources (Teonniessen et al., 2008; Dorward et al., 2009). Poor human and animal health and heterogeneous patterns of population density, which result in fragmented rural markets, are among other major problems faced by African farmers (Dorward et al., 2009).

Changes in the global agricultural economy are providing smallholders with both new constraints and new opportunities. The demand for higher value and processed food products has grown worldwide as a result of increasing purchasing power and rising opportunity cost of the time required for food preparation (Gehlhar and Regmi, 2005). As a consequence of trade liberalization policies, many African countries have begun producing non-traditional agricultural products to

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1The paper has been accepted for publication in the Review of Policy Research, but the volume in which it will appear is not yet known.
2International Food Policy Research Institute (IFPRI)
3Center for International Forestry Research (CIFOR)
diversify their agricultural exports and find new markets (Okello et al., 2007). Farmers are increasingly catering to long and sophisticated supply chains and have to meet stringent food safety standards, particularly in discerning international markets (Markelova et al., 2009). The rise of supermarkets across both developed and developing countries has implications for the entire food marketing system, as it alters procurement systems and introduces new quality standards (Reardon et al., 2005; Hernandez et al., 2007). The rapid spread of supermarkets and large discount stores has led to the transformation of the African retail food sector with large retailers displacing more traditional ones, such as small shops and public markets (Weatherspoon and Reardon, 2003).

Even though these changes create opportunities to raise agricultural incomes, these modern value chains have mostly engaged large and medium farmers for the scale and quality standard reasons, bypassing small farmers, who are usually the focus of pro-poor development efforts (Okello et al., 2007; Hernandez et al., 2007). Smallholders, who in addition to the landless represent the poorest segment of the rural population, can potentially benefit from participating in market exchanges since most of them are linked to the markets in one way or another. While most are engaged in local markets that may not render much profit, there are instances and opportunities for their participation in more profitable domestic and even export markets (Ashraf et al., 2008; Weatherspoon and Reardon, 2003).

However, their successful involvement in markets is challenged by multiple barriers to entry, even though they have some competitive advantages over larger commercial producers, especially in their low transaction costs in accessing family labor and in their intensive local knowledge (Poulton et al., 2005; Pingali, 2006). First, much of the literature points to the pervasive imperfections that characterize markets in the developing world (De Janvry et al., 1991). Lack of information on prices and technologies, high transaction costs, and credit constraints make it difficult for smallholder farmers to take advantage of the marketing opportunities (Key et al., 2000; Poulton et al., 2005; Shiferaw et al., 2008). Access to profitable high-value markets is more limited for smallholders since access to these markets may require expensive third-party certification (Barrett et al., 2001; King and Venturini, 2005). In addition, with the increasing number of the free trade agreements affecting both national and international commodity markets, smallholder farmers are being forced to compete not only with their local cohorts, but also with farmers from other countries as well as domestic and international agribusinesses (Schwentesius and Gómez, 2002). The absence of effective and sustainable rural institutions is often identified as another challenge for the commercialization of rural areas in Africa (Poulton and Lyne, 2009; Shiferaw et al., 2008; Cadot et al., 2006).

**The case for collective action in smallholder marketing**

There is increasing evidence from both research and practice that one way for smallholders to overcome market failures and maintain their position in the market may be through organizing into farmer groups or producer organizations (Markelova et al., 2009; Poulton and Lyne, 2009). When acting collectively, these smallholders may be in a better position to reduce transaction costs of their market exchanges, obtain the necessary market information, secure access to new technologies, and tap into the high-value markets, which would give them an advantage when competing with large farmers and agribusinesses (Key et al., 2000; Stockbridge et al., 2003; Kruijssen et al., 2009). Producer groups can simplify long marketing chains by directly connecting smallholders to markets bypassing various marketing intermediaries and negotiate better terms of trade as well as lower vertical and horizontal coordination costs (Shiferaw et al., 2006; Bernard and Spielman, 2009; Barrett, 2008). They would also be able to adjust to the changing food sector and participate in the new procurement systems by overcoming volume and coordination problems (Weatherspoon and Reardon, 2003; Poulton and Lyne, 2009).

Research in natural resource management (NRM) has already demonstrated the advantages of collective action – voluntary action by a group to pursue shared objectives (Marshall, 1998) – for technology adoption, and to ensure that resource use is efficient, equitable, and sustainable (Meinzen-Dick et al., 2002). Even though NRM and market access differ both in terms of obstacles faced by smallholders and in terms of welfare opportunities to be gained from participation, cooperation has been recognized as crucial for the poor to overcome challenges presented by unfavorable policy and market contexts and create sustainable livelihood options (Thorpe et al., 2005; Heyer et al.,

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*Based on this definition of collective action, contract farming is not considered collective action as parties are bound to act together by contracts with financial stipulation, and not on a voluntary basis.*
Besides, more and more attention is being given to the importance of institutions, including those of collective action, and their effectiveness in poverty reduction and agricultural development in addition to pro-poor macroeconomic policies (Barrett, 2008; Kirsten et al., 2009; Mwangi and Markelova, 2009).

The idea of farmer organization and collective marketing is not new and continues to be advocated by some policymakers, donors, and practitioners as a valid development strategy, especially for sub-Saharan Africa, since agricultural growth there is linked with the commercialization of smallholder farmers (Teonniessen et al., 2008; Bernard and Spielman, 2009). Earlier experiences with cooperatives, for example, were decidedly mixed; their failure can be explained in part by the mechanistic approach to institutional development that reflected the overall technocratic approach to development in the 1970s (Ostrom et al., 1993). However, the cooperative movement demonstrated that smallholder groups can achieve economies of scale that overcome the high transaction costs that individual farmers face (Shepherd, 2007; Temu, 2009). Hence, there is a need for a better understanding of the factors that matter for successful and effective group formation for marketing.

The extensive literature on collective action in natural resource management has identified factors such as group composition, management rules, and policy environment, among others, which influence successful and equitable cooperation around resource management. It has shown that effective local collective action that was built with consideration of these factors can indeed be a useful approach for the poorer resource-dependent communities to sustainably manage their resources, improve resource conditions, and build strong bottom-up institutions (see Meinzen-Dick et al., 2002 for a collection of studies, and Agrawal, 2001). Since groups organized for the purpose of resource management have been studied and conditions for their success and failure have been identified, the lessons from these studies can be applied to the study of collective action in other development domains. This paper uses these experiences from NRM to identify issues that are important for collective action in smallholder marketing and applies them to the discussion of factors that may influence the formation and effective and sustainable operation of producer groups. Several case studies of farmer groups in Africa are used to illustrate how these factors are relevant for smallholder marketing and enhance their understanding in the African context. Policy-relevant implications are drawn based on these factors as recommendations on how to catalyze effective and lasting groups of smallholder producers and strengthen the existing groups.

What matters for collective action in marketing
The NRM literature offers numerous lessons that can be applied to collective action in marketing (for review, see Agrawal, 2001; Baland and Platteau, 1996; Meinzen-Dick et al., 2002; Ostrom, 1990, 2007). In particular, this literature identifies three broad categories of factors that are important for effective formation and functioning of groups: characteristics of the resource (boundaries, size); characteristics of the user groups (shared norms, level of social capital, endowment heterogeneity); and institutional arrangements (access and management rules, enforcement mechanisms, accountability structures). The same principles may also be relevant and applicable for collective action in other areas, including smallholder marketing. Resource characteristics can be considered as the types of products and the types of markets; characteristics of user groups can be understood as the attributes of the smallholder marketing groups. The concept of institutional arrangements (such as rules and sanctions) in NRM can be applied directly to the area of marketing as various operation rules such as bylaws and membership fees. The last important element to consider is the external environment, which involves the groups’ relationships with the state, market, and civil society.

Types of markets
In a situation of well-functioning rural markets, small agricultural producers in developing countries, just as their better-endowed peers, can choose to sell their products to several types of markets: local (rural), emerging urban, regional, and international. While smallholders face many barriers to entry into any of these markets, local markets are by far easier to reach than the other three. First, there are smaller logistical hurdles, such as transportation costs, quality standards, and scale issues in accessing local markets. Second, at the local level smallholders do not have to deal with competition from larger

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5 For peri-urban smallholders, informal urban markets can be generally considered as local since these are most accessible to them (as opposed to supermarkets, etc). Even though the distance to the more profitable urban outlets is reduced for these smallholders, they face the same issues (scale, quality, etc) in accessing these markets as their rural counterparts.
domestic and international farmers. Since local markets may be easier to access for smallholders, these markets offer relatively low gains from organizing since each farmer can sell individually (Markelova et al., 2009). Where collective action comes into play is in the attempts to reach larger markets, i.e., domestic urban, regional, and international, where acting collectively enables small farmers to deal with transportation and storage issues, acquire technologies and certificates to comply with required quality standards, and reach the necessary scale to supply the desired quantity of their products.

In general, “longer” marketing chains present greater disadvantages for smallholders and thus create more incentives for cooperation (Markelova et al., 2009). Urban domestic markets in many African countries are being transformed beyond the simple exchanges for immediate local consumption with the appearance of domestic and multinational chains that are in search of suppliers (Weatherspoon and Reardon, 2003). These growing urban markets, represented by supermarkets, restaurants and hotels, have a potential to offer high returns to smallholders who are “upgraded” with capacity to meet the needs of these buyers (Weatherspoon and Reardon, 2003). The requirements that these outlets have for their suppliers are beyond the capacity of individual smallholders (Schwentesius and Gómez, 2002). For example, the case of a group of potato farmers in Uganda shows how collective action enabled small potato growers to become a steady supplier to the popular Nandos restaurant chain, thus increasing their incomes and securing a stable market. In return, Nandos receives a guaranteed amount and quality of potatoes, which would not have been possible for each individual farmer (Kaganzi et al., 2009).

However, export markets present many more challenges in terms of quality control, transport, and market risks. Even by overcoming some scale and quality issues with collective action, smallholders may still be unable to compete with agribusinesses and internationally set quality and food safety standards because of high costs and complicated procedures of obtaining the necessary certificates. Despite these challenges, there are some documented examples of smallholder groups supplying export markets. Okello et al. (2007) present a case where farmer groups in Kenya, Ethiopia and Zambia cultivating green beans were able to export their crops to Europe.

An increasingly important sector of the export market is the organic market, which has been rapidly growing since the 1990s and presents opportunities for developing-country producers to participate in these markets because many of them may already be practising sustainable land management techniques without pesticides (Robins et al., 2000). However, stringent certifications are necessary in order to supply organic outlets in the developed countries, which stands as a challenge to many small farmers who are practising organic farming but cannot overcome the obstacles of costs and knowledge constraints to obtain the formal status as organic producers (Barrett et al., 2002). Since international certification and underlying inspection can be very expensive, for many small farmers organizing into groups may be one way for reducing these high costs. There are already schemes in place for the organic certification of producer groups where the group pays one fee for the certification, and all members get the certification provided that the internal monitoring system within the group functions well and all member plots are inspected each year (Soil Association, 2001).

For example, TWIN trading, a UK-based company, works with several producer groups in 10 developing countries, including several countries in Africa, to help them obtain and maintain organic (and fair trade) certification for coffee, cocoa, and tea by operating the revolving funds to finance credit needs of small-scale farmers (Browne et al., 2000).

Both of the examples above show that the area where organizing of small producers into groups seems to be particularly important is accessing the quality-conscious markets, which requires investments in certifications and compliance with food-safety standards, as well as high coordination costs (Narrod et al., 2009). These markets, sometimes referred to as “high-value markets,” offer higher premiums and, thus, are more desirable. Potato-growing groups in Uganda were successful in selling their crops to a fast food chain in Kampala when they worked on improving the quality of their outputs to satisfy the company’s quality requirements (Kaganzi et al., 2009). The Kenyan green bean case also highlighted the efforts of producer groups to comply with food safety standards set by the European Union by obtaining certifications and complying with various food-safety regulations (Okello et al., 2007).
Types of products

Closely connected with the type of markets is the type of products that are best suited for collective marketing with the purpose of increasing opportunities for smallholders. Here, the links with NRM are also well pronounced. The degree of predictability, mobility and storage are important factors for the effectiveness of collective action in natural resources (Agrawal, 2001; Rasmussen and Meinzen-Dick, 1995). Similarly, the type and natural properties of a product are important for success of farmer groups and may act as an incentive or disincentive for organizing.

For the purpose of marketing, the main categories that agricultural products grown by smallholders fall into are staples, perishables and cash crops (Poulton et al., 2005). Staples, such as maize, are easy to store and transport; in addition, a good portion of such crops is usually destined for local markets for local consumption through traders or sold to government-run marketing boards that guarantee a buyer, even though usually with a low price (Alene et al., 2008; Hellin et al., 2009). Therefore, there may not be many incentives for farmers to organize around the marketing of staples. Besides, Barrett (2008) reports that a relatively small portion of smallholders in eastern and southern Africa is involved in staple food grain sales, and the transaction costs due to poor institutional arrangements and physical infrastructure are quite high in the marketing of staples (especially compared to higher-value commodities).

Similar sentiment regarding high transaction costs is found in the Alene et al. (2008) account of maize farmers in Western Kenya. Even though collective action among staple producers may have advantages in terms of bulking and storage (i.e., overcoming scale issues), quality control and accessing inputs, the marginal benefits from collective (as opposed to individual) marketing may not be enough to offset transaction costs associated with organizing due to lower revenues from marketing these types of products (Berdegue, 2001; Coulter, 2007).

Therefore, in most cases, there may not be many advantages in the group marketing of staples. However, as the Uganda potato case illustrates, there is a growing urban market for staples, which can become accessible for smallholders organized into groups (thus reducing some transaction costs) and provide a steady source of income (Kaganzi et al., 2009). Interestingly, this case shows there are opportunities for smallholders to sell their staples in profitable markets, thus turning them into cash crops.

It is commonly acknowledged that it is the transaction costs associated with the marketing of a crop that enable it to demand a higher price. Typically, it is the perishable goods, such as fruits and vegetables, which become “high-value” due to the costs associated with storage and transportation. However, there are case studies where a staple crop can also get a higher price as a result of agroprocessing and quality improvements, or simply increased market demand (Gruere et al., 2009; Devaux et al., 2009). The example of maize sold through producer associations that were part of the Maize Marketing Movement in Western Kenya (Alene et al., 2008) shows how a staple crop can become a cash crop through a process of quality improvements and linkages with the industrial sector, which offers better prices than local traders or the state marketing board.

Perishables not only carry a higher risk, but require more sophisticated and costly storage and transportation facilities, thus precluding smallholders from successfully marketing them due to the lack of funds, capital and technical expertise (Markelova et al., 2009). Because of the special quality requirements and demand-supply patterns, coordination is of vital importance in the marketing of such products (Poulton and Lyne, 2009). Ashraf et al. (2008) mention that some types of perishables, such as French beans and baby corn in Kenya, even have an advantage for small farmers, since they are less capital intensive, simpler to grow, and have shorter growing periods. Moreover, the revenue potential from marketing of these crops is more likely to offset organizational costs and provides more incentives for farmers to organize (Coulter, 2007; Berdegue, 2001). Acting collectively may enable them to obtain the necessary equipment and certifications, cover transportation costs, and access technical expertise and market knowledge to market horticultural or livestock products. This advantage of collective action in marketing perishables becomes even more evident for growing local quality-conscious markets, such as supermarkets, which are willing to procure these crops from organized smallholders over individual small producers (Schwentesius and Gómez, 2002). Processing fresh produce is a way to reduce perishability and add value. This is another area where collective action allows smallholders to capture more value from high-value crops by owning processing facilities, even though such ownership may require a higher level of financial capital and technical knowledge (Bebbington, 1996; Stringfellow et al., 1997).
Livestock marketing may be another arena where smallholder groups can offer advantage over individual farming. Even though there are not many documented experiences, Kyeyamwa et al. (2008) report that small producers face particularly high transaction fees and other barriers (such as a small number of animals owned, lack of relevant market information, etc.) that reduce their incentives to participate in formal markets. In the study of several sites in the cattle corridor of Uganda these authors find that the majority of formal sales happen at the primary market level (collection sites), which renders a much smaller profit than the larger secondary and the much larger tertiary/terminal markets. They suggest that innovative institutional arrangements, such as vertical and horizontal coordination, can help reduce these barriers for small livestock producers and enable them to enter more profitable markets (Kyeyamwa et al., 2008).

The more traditional cash crops, such as coffee and cocoa, usually require processing, so smallholders often have little choice but to sell to larger farmers or agribusinesses that can afford processing equipment. However, an example of the smallholder tea associations in Malawi shows that organized smallholders can enter formal contracts with tea processors, who in addition to buying the tea crop also provide input credit, leaf collection and transportation facilities, and extension services (Chirwa and Kydd, 2009). The example of cash crop producers entering organic and fair trade markets through group certifications (Browne et al., 2000) shows that collective action can offer cash crops a potential for even greater revenue.

**Types of producers and their organizations**

The literature on NRM reports that there are certain characteristics, such as group size and diversity of members, which affect the success of collective action. Similarly, the literature on marketing finds that for the most part, the same factors may be important for the effectiveness of the producer groups. For example, smaller groups have higher internal cohesion because it is easier to monitor other members (Coulter, 2007; Agrawal, 2001). The cases of successful collective marketing efforts report a smaller group size, in the range of 20-40 members (Markelova et al., 2009). There is evidence that larger groups can achieve economies of scale, but at the same time this increases the cost of coordination, which can require delegating much of the decision authority to a management body (Stringfellow et al., 1997; Bernard and Spielman, 2009; Poulton and Lyne, 2009). Besides, larger group size may lead to management inefficiencies or even rent seeking within the management structures as peer-based accountability, monitoring, and sanctioning structures may weaken (Poteete and Ostrom, 2004). Federated structures can build upon small group dynamics, but also take advantage of scale economies (Bebbington, 1996; Devaux et al., 2009).

Another important factor for producer groups is their internal composition. In the literature on collective action in NRM there is a debate on whether heterogeneity in terms of wealth, age, ethnicity, location, and gender results in better-functioning groups (Agrawal, 2001; Baland and Platteau, 1996). The same question applies to collective marketing. On the one hand, there is evidence that groups whose members are of the same socioeconomic status are more stable and effective, since homogeneity may lower coordination costs and increase compliance (Stockbridge et al., 2003; Bernard and Spielman, 2009). On the other hand, internal differentiation may allow for the natural evolution of leadership in a group (Thorp et al., 2005), but can also lead to concentration of the wealthier members in the decision-making positions (Bernard and Spielman, 2009). Besides, the example of Ethiopian grain marketing cooperative shows that in many cases the wealthiest and the poorest do not join these groups for lack of incentives, albeit of different nature, creating the “middle class” effect in these groups. This study also shows a preference for “geographic” homogeneity: 87% of the cooperatives studied accept only members who live within the same kebele (administrative unit) as a means of reducing monitoring costs (Bernard and Spielman, 2009).

Shared norms and values, which often arise as a result of prior involvement in groups and networks, is another enabling factor for collective action (Agrawal, 2001; Uphoff and Wijayaratna, 2001). Marketing groups that build upon experiences of working together in the past have an advantage in terms of the trust and cohesiveness (Kruisjen et al., 2009; Place et al., 2004). For example, Ethiopian pastoralists in the Borana area have been effective in marketing their livestock not just in Ethiopia, but even to the Nairobi markets – their groups were initially formed as savings and credit associations (Desta et al., 2006). Internal

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6See, for example, problems related to management inefficiency in the growing cooperatives in Latin America in the 1970s (Dorner, 1992).
group dynamics and connections between group members through other activities are also important. Barham and Chitemi (2009) show that in Tanzania marketing groups in which members are involved in other group activities beyond marketing are more likely to improve their marketing performance. The authors conclude that sustaining these “extra” activities necessitates the establishment of other internal institutions in the groups, which then facilitate coordination and resource mobilization for marketing.

There are cases where collective marketing efforts fail because external actors push marketing activities on groups that have not been involved in marketing before, and therefore, do not have the necessary capacity or incentives to get involved in these activities (Stringfellow et al., 1997). In their study of Ethiopian pastoralists in the Borana area, Desta et al. (2006) conclude that the pastoral groups may not have been able to take advantage of the increased marketing opportunities had it not been for complementary investments to increase their capacity related to credit, savings, small-business practices, and even basic literacy and numeracy. Finally, leadership is important for collective action in both NRM and marketing. Group leaders should be knowledgeable and skilled in collective enterprise as well as motivated and trusted by the group members (Markelova et al., 2009; Meinzen-Dick et al., 2002).

Institutional arrangements

Institutional arrangements, such as organizational structures and rules, are important for shaping the operations of farmer groups, be it in NRM or marketing. The NRM literature shows that simple and understandable rules increase compliance within organizations since they are easily monitored (Agrawal and Ostrom, 2001). Besides, such rules also reduce monitoring and coordination costs (Shiferaw et al., 2006; Poulton and Lyne, 2009). Graduated sanctions and low-cost adjudication are also important, alongside established accountability and enforcement mechanisms (Stockbridge et al., 2003). In addition, rules crafted by the group members themselves and adapted to the local context (as opposed to the rules imposed from outside of the group) have a higher likelihood of being understood and followed, which would contribute to the effectiveness and sustainability of collective marketing efforts (Agrawal, 2001; Markelova and Swallow, 2008). For example, earlier smallholder tea associations in Malawi, established in a top-down manner by the government, have not been sustainable, and many tea farmers have left and organized into their own smaller associations (Chirwa and Kydd, 2009). The provision for the rules to be established endogenously is especially important for smallholders to identify with their organization and comply with the rules (Agrawal and Gibson, 1999).

The literature shows that the types of organization that are most appropriate for collective commercial activities range from small groups to federated structures to multiple linkages and networks along the commodity value chain (Bebbington, 1996; Devaux et al., 2009). Public-private partnerships have also been successful in linking smallholder groups with other actors in the marketing chains who enable these groups to “upgrade” their facilities, skills and production techniques. For example, groups of green bean producers in Kenya, Ethiopia, and Zambia were able to reach international markets as a result of links and collaboration with government ministries, donors, and private companies (Okello et al., 2007). Overall, the pattern that emerges from examples of various producer groups points to the need to match farmers’ skills, needs, and managerial experience with different forms of organizations.

External environment

The external environment for producer marketing groups primarily involves their relationship with the state. Interestingly, for collective action in NRM, relations with the market is another important aspect, and links to markets are often seen to reduce collective action in resource management since in the communities with less market integration, people are more interdependent (Agrawal, 2001).

For successful collective marketing, an enabling political and economic environment is crucial. Group formation and operation cannot happen in a state of hostility or macroeconomic instability as they undermine incentives for cooperation (Thorp et al., 2005; Chirwa et al., 2005). The examples of good governance that would enable collective marketing by smallholders include legal and credit systems available and favorable to the poor, which would increase livelihood options and create incentives to join with others for marketing activities (World Bank, 2001). Furthermore, reducing the bureaucratic red tape can allow groups to register and access input and service markets easier. For example, Shiferaw et al. (2008) show that producer marketing groups in Eastern Kenya were only able to register as self-help groups by Kenyan law, thus lacking the status of business enterprises, which restricts their access to financial institutions. On the other hand, Coulter (2007) reports that
African smallholders have been more successful in the marketing of horticultural products than their cohorts in India as a result of less stringent bureaucratic procedures.

Coulter (2007) shows how macroeconomic policies affect the incentives for cooperation around various types of crops. For example, trade liberalization can open opportunities for certain producers to find niche markets abroad and organize to obtain the necessary quality certifications to sell their products to larger markets yielding greater returns. On the other hand, opening up of the markets had negative effects on cooperatives in Tanzania, with the demise in marketing activity greater for the staple producer groups than for groups involved in the marketing of other crops, such as coffee (Coulter and Golob, 1992). In Malawi, farmers’ clubs contributed to the intensification of maize under the parastatically controlled system of the 1970s and 1980s, but failed in the liberalized regime of the 1990s; they now focus on cotton, tobacco and other high-value crops (Chirwa et al., 2005). However, as in the case of the maize cooperatives in Uganda, market liberalization, although damaging initially, allowed these groups to “reinvent” themselves by reducing the group size, introducing accountability and clear communication flows into the internal structure, shifting the focus of activities to simultaneous marketing and intensification, and making quality improvements by engaging with the UN World Food Program. All of these changes led to the increase in revenue received by these producer organizations (Coulter, 2007).

In addition, Hazell et al. (2007) highlight that efforts to increase market access for smallholders must include the provision of the “basics” such as rural roads, education, access to water, and agricultural extension. Improving rural communication systems is cited as another important input into linking small farmers with markets (Kyeyamwa et al., 2008). Investments in these “basics” will reduce the infrastructural and informational remoteness of the smallholders in rural areas, thus giving them opportunities to market their products collectively. For example, Barham and Chitemi (2009) report that in their study sites in Tanzania farmer groups who had access to a reliable water source improved their marketing performance. Access to services, both financial and non-financial, is another important aspect of the sociopolitical context, which would enable producer cooperatives to compete in agri-food markets (Poulton et al., 2005; Hazell et al., 2007).

Policy implications: How to make collective action effective for smallholder marketing

Creating incentives for cooperation

The factors that affect the effectiveness, success and sustainability of collective action in marketing shed light on what could be done to create an environment favorable for groups of smallholders. Primarily, there is the need to create appropriate incentive structures for farmers to organize around marketing when such cooperation would bring about improvement in their livelihoods. Such incentives hinge on the marketing activity undertaken being profitable for smallholders and being “doable” by them.

An in-depth analysis of a particular commodity value chain can reveal whether groups of smallholder farmers would have an advantage over individual efforts in marketing a particular commodity. For example, while collective action is necessary for accessing profitable outlets for certain products, such as perishables, staple goods in many cases can be successfully sold by individual farmers. Similarly, local markets may not be “worth” the investment in producer groups since the price received would be the same for groups and individuals. However, organizing for the purpose of supplying an urban outlet (restaurants, hotels, supermarkets) may motivate the need for cooperation. Place et al. (2004) report that, among the 442 surveyed rural households in Central Kenya, nearly a half (46%) were strongly interested in collective action for selling milk (a perishable commodity) and 55% were interested in joint processing activities.

Once a group is formed or an existing group is chosen for marketing activities, and the commodity and markets are established, the technical and human capacity of the group to handle the task needs to be assessed. If a marketing scheme involves specialized skills and knowledge that is not available to the group, its activities may be hindered by the lack of expertise, thus nullifying the incentives for collective marketing (Stringfellow et al., 1997). Therefore, equipping groups with technical and marketing skills, as well providing management and leadership training, would strengthen them and ensure their duration (Schwentesius and Gómez, 2002). For example, the application of the participatory Enabling Rural Innovations (ERI) approach for enhancing market participation for farmers in Uganda and Malawi built their capacity to identify viable marketing opportunities for new and existing products by
matching these with community assets, which led to the
development of profitable agro-enterprises through collective
action (Kaaria et al., 2008).

To enable farmer groups to effectively compete in markets,
certain “basics” need to be put in place. As discussed above,
these conditions include improving rural infrastructure, providing
extension services, making credit markets accessible to the poor,
and making relevant market information available (Shiferaw et
al., 2008). Since the main challenge for smallholders to engage in
markets is high transaction costs, such interventions would lower
the costs for farmer groups to participate in markets, creating
additional incentives for them to organize around an appropriate
marketing activity. In addition, making the registration process
easier would facilitate the smooth formation and operation of
groups in situations where formal registration is required to
access inputs and services.

Furthermore, the literature on NRM reveals that cooperation
itself may also carry direct and hidden costs, which may
discourage some farmers from joining groups (Meinzen-Dick
et al., 2002). Such costs may include the trade-offs between
self-interest and collective good, membership fees, and the
possibilities of free riders benefiting from the collective efforts if
the goods provided through the group efforts are non-rivalrous
and non-excludable (Bernard and Spielman, 2009). Even though
an economic cost-benefit analysis may reveal some direct
commercial “pluses” and “minuses” of cooperation, a deeper
examination of the surrounding context is necessary to uncover
the “hidden” barriers to group formation. Studies of collective
action in natural resource management can provide further
insights on this issue.

Role of outsiders in collective marketing
The literature on marketing shows that farmer organizations
rarely self-organize on a formal, as opposed to informal, basis.
Since a certain degree of formality is needed to supply profitable
markets, such as urban outlets or international quality-conscious
markets, external input is needed to facilitate an establishment
of a formal farmer organization (Markelova et al., 2009). The
role of a facilitator, or a chain champion, is crucial for enabling
farmer groups to access profitable markets. This facilitator serves
as a catalyst of collective action around marketing by providing
information, technical assistance, and, in some cases, financial
means as well as building managerial and entrepreneurial
capacity of the group (IFAD, 2001; Chirwa et al., 2005; Kaganzi et
al., 2009; Stringfellow et al., 1997). By serving as a “development
intermediary” (Bianchi, 2002), this facilitator also enables the
farmers to renegotiate power relations along the value chain
by introducing marketing and institutional innovations, which
involves redefining roles and objectives, finding new ways to
market a product, and access to sources of funding and training
opportunities (Uphoff and Wijayaratna, 2000). In sum, this actor
smoothes the processes by which farmer groups overcome
barriers to entry, such as low technical and organizational
capacity, informational asymmetries, and often even financial
constraints (IFAD, 2001).

While the need for an outside facilitator of collective marketing
is clear, the question of who serves in this role is less settled.
This position can be assumed by the state government and its
agencies, by members of civil societies (NGOs), or even by firms.
The last category always causes concern as it is assumed that
commercial agents always seek to maximize their profits without
necessarily sharing the benefits with smallholders. For example,
Ribot (1998) reports that merchants and wholesalers captured
the profits from Senegal’s charcoal commodity chain. Successful
public-private partnerships (see Narrod et al., 2009), as well as
cases of local firms partnering with producer groups (Kaganzi
et al., 2009), provide counterexamples where a commercial
enterprise benefits from a strong producer group and thus
acts to enhance the ability of such groups to participate in a
commodity value chain.

The state, on the other hand, can play an important role in
creating the enabling environment discussed above, thus
enhancing the incentives for farmers to join together as well
as facilitating that process. In addition, much has been written
about the public-sector provision of business development
services, which the private sector is unable to provide efficiently
due to high transaction costs, dispersed clientele, and low
profitability of such investments (Miehlbradt and McVay, 2003).
Besides, the state is more likely to have a pro-poor orientation
in its investments, making the support of farmer groups a part
of its development agenda. However, Shepherd (2007) warns
against making business development for the poor part of social
policy because successful marketing often has to prioritize profits
over equity or sustainability concerns. Besides, the private-sector
actors prefer to deal with farmers who have demonstrated
capacity for commercial production, which by default often
excludes the poorest who are less likely to form groups in the
first place because of the low asset endowments (including lower stocks of social capital) or may be excluded from existing and/or successful groups, especially those formed for economic purposes (Thorp et al., 2005; Quisumbing et al., 2008).

Another important question that comes up when considering the role of the public and private sector in promoting collective marketing is the issue of financing, be it direct funding or through the credit market. Based on the evidence presented in this paper, it is clear that some type of outside funding is necessary for groups to reach a certain asset level at which they can successfully participate in profitable market exchanges, be it the costs of machinery, transportation, or certificates. In fact, Shiferaw et al. (2008) show that in the case of the producer marketing groups in Eastern Kenya, their effectiveness in marketing legumes was hampered by the lack of funds, even in the form of credit, for certain activities. Interestingly, there are examples from the region where groups were able to self-finance even their start-up costs through membership dues – the green bean groups in Kenya, Ethiopia, and Zambia finance most of their costs through entry fees and donations from members (Okello et al., 2007).

Civil society, represented by NGOs and non-profit agricultural research institutions, may be a better-suited facilitator of collective action in marketing, while not serving as the donor (Thorp, 2002; Escobal and Torrero, 2006). In addition to having a stated development agenda, these organizations also work “on the ground” and may understand the context, especially in terms of the existing social capital, that would provide the basis for marketing groups. For example, Barham and Chitemi (2009) show that producer groups in Tanzania were able to improve their marketing performance as a result of the training in marketing skills and group strengthening as well as linkages with agribusinesses provided by NGOs. However, even NGOs may not always be altruistic and disinterested facilitators. Shepherd (2007) reports that some groups may see the best chances of demonstrating short-term success as coming from working with richer farmers who already have a market orientation, similarly to the private sector. NGOs may also compete with each other to work in villages with known dynamic leaders.

Therefore, the participation of all three sectors may be necessary for a group of smallholders to effectively participate in markets. This calls for innovative institutional arrangements between state agencies, companies, NGOs, and producer groups that would take care of various relationships along a commodity value chain and ensure the timely provision of inputs and business development services (Stringfellow et al., 1997; Weatherspoon and Reardon, 2003; Okello et al., 2007; Teonniessen et al., 2008). These arrangements should include innovative financing schemes through collaboration with lending institutions to make credit and savings options available for producer organizations (Schwentesius and Gómez, 2002).

This recommendation fits well with some established frameworks for policy processes, such as Sabatier’s Advocacy Coalition Approach (Sabatier, 1988). It highlights the importance of involving various members of the policy community and private institutions who share similar beliefs to ensure that sound policies are formed through processes of learning and collaboration. Such coalitions aim to promote their members’ interests, which can be done effectively only by engaging in policy debate with other coalitions (Sabatier, 1988; Lertzman et al., 1996). Such collaboration between various levels of relevant government agencies, interested private firms, including finance institutions, and members of the civil society (development NGOs and agricultural research organizations) may be able to create conditions for successful functioning of farmer marketing groups. These coalitions can also work to shift power relations along the marketing chains to catalyze even greater structural changes in favor of the poor.

**Sustainability and equity considerations**

Closely related to the issue of outside assistance is the question of how to give collective marketing a development, or pro-poor, focus. The literature shows that market development is not always going to help the poorest, since they do not have the minimum asset threshold (human, physical, and even social) needed to participate in market exchanges. However, many case studies demonstrate that collective marketing does enhance livelihood options for smallholders who may be unable to overcome barriers to entry on their own.

Considering the need for long-term orientation of pro-poor development policies and programs, sustainability of collective marketing is an important issue. Sustainability in this case involves both business (marketing) sustainability, and the sustainability of collective action, i.e., the stability and durability of the group. The former must take into account the commercial nature of market exchanges; therefore, prioritizing poverty reduction may hinder the business sustainability (Shepherd,
This is where the participation of the public sector (in providing financing opportunities for the poorest, for example) may allow for the reconciliation of the market development and social development agendas. However, Coulter (2007) shows that while public-sector financing in the form of subsidies, for example, may be needed for a time, their continued presence may create perverse incentives for collective action.

Furthermore, the involvement of any type of an outside agent needs to be carefully planned and timed. While this involvement is crucial, especially in the initial stages of market development and organizing, its longevity may hamper the sustainability and long-term effectiveness of the group by creating dependency (for example, on continued financial support). The facilitating agent must carefully assess its role, capacity (both financial and human), and level of participation at the onset of the project, and design a viable exit strategy. Inability to adjust to changing marketing context and absence of a sustainable funding source could also lead to the failure of the producer group (Ashraf et al., 2008). Building and strengthening the group’s capacity is a valuable building block of such strategy. However, some ongoing facilitation in the form of “repair and maintenance” support may be needed in order for the farmer groups to scale up their operations or maintain their competitiveness in the existing markets (through quality upgrades and organizational adaptations, for example) (Kaganzi et al., 2009).

Equity is another issue for pro-poor collective marketing. There is ample evidence that poorer and more disadvantaged community members tend to be excluded from participation in such groups. For example, entry and membership fees cited in several case studies indicate that the poor may be precluded from participation in the marketing groups, especially those catering to more profitable markets (Okello et al., 2007; Ashraf et al., 2008). Bernard and Spielman (2009) show that the asset endowment in form of land and livestock holdings may be a determinant to participation in grain marketing cooperatives in Ethiopia. While they also show that there are some positive spillovers from collective activities, such as increased supply of production inputs, these benefits to non-members are limited, and there is evidence that group activities can have negative consequences for non-members, such as further reduction in available credit. Desta et al. (2006) echo these findings: in their study of collective action among pastoralists in the Borana Plateau in Ethiopia, it was the groups residing near towns and market centers (as compared to “pure” pastoralists from more remote locations) who benefited from increased marketing opportunities.

Delayed payments, a feature of some of the newer procurement chains, may also force smallholders to sell their crops at a lower price directly to local wholesalers for immediate payment rather than going through a marketing group (Hernandez et al., 2007; Shiferaw et al., 2008). Barham and Chitemi (2009) also report that in Tanzania groups dominated and led by women fared worse in their marketing activities than male-led and male-dominated groups. Thus, policies and programs aiming to enhance marketing access for the poorest need to carefully consider their targeted beneficiaries.

Conclusions: Lessons learned

Case studies of collective action in marketing show that organizing for marketing purposes can indeed enable smallholders to overcome multiple market imperfections that are pervasive in the developing world as well as deal with high transaction costs associated with marketing. The success and effectiveness of these groups depends on certain factors, such as group size and composition, types of products marketed and types of markets targeted, the external environment, and the institutional structure chosen. In most cases, facilitation by an outside agent from the private, public, or civil society sectors (or all three) is needed to catalyze both collective action and market development, and these actors may prefer to work with groups rather than individual smallholders to maximize their investments and reach a greater number of the poor.

Collective marketing may also offer some benefits that go beyond monetary gains. For example, organizing around marketing activities can increase the bargaining power of smallholders, allowing them to negotiate better terms of trade. It can promote linkages across the market chain and connect producers, processors, and buyers into networks that would be beneficial for all actors, creating valuable pro-poor coalitions. Moreover, the leverage that acting together gives smallholders may also have socio-cultural importance, if the smallholders are an ethnic minority or the products chosen for commercialization are underutilized, but culturally important species.

However, despite the advantages and benefits that collective action introduces into the marketing activities of the smallholders, this approach to development is not a “silver
bullet” applicable and replicable in all situations. The issues of creating and sustaining incentives and determining the appropriate level of outside assistance may add to the high physical costs and other collective action challenges, such as dealing with free riders, that are involved in organizing farmers around marketing. Greater attention is thus needed to assessing the costs of organizing and operating collectively, and whether these costs are borne by group members or by external programs. In addition, the distributional consequences of such activities on women and the very poor remain somewhat unclear. The possible negative effects of group marketing on non-participants (such as higher prices for inputs, limited market access, and lower prices for outputs) present another piece of evidence that collective action may not be able to make all markets work for all poor.

Lastly, when considering pro-poor market development, there is a need to be realistic about the potential benefits and benefit recipients of collective action. While collective marketing does enable smallholders to raise incomes through participating in more profitable markets, these smallholders may not represent the poorest layers of the rural communities. In fact, there is evidence that the poorest may be disadvantaged in the accumulation of not just physical and human capitals, but social capital as well (Quisumbing et al., 2008), precluding them from benefitting from collective marketing. A study of producer associations in Madagascar also found that, while group activities did raise returns from marketing, they did not facilitate entry of subsistence farmers into commercial farming (Cadot et al., 2006). Whether there are possible positive spillover effects for the poorest from collective marketing remains to be seen.

For the purpose of determining the economic and social returns of collective marketing, there is a need to examine both positive and negative spillover effects – on other producers and on consumers of such activities. Costs and spillover effects also relate to the critical issue of whether (and how) collective marketing initiatives can be scaled up to benefit large numbers of smallholders, rather than being limited to pilot projects with intensive external assistance. African governments who seem enthusiastic about the cooperatives approach to engaging smallholders in markets need to understand these costs and spillover effects when advising communities to organize around marketing.

Related to the aforementioned issues and in a way summarizing them is the question of the ultimate goal of development programs and research that work on organizing smallholders to jointly market their products. Is the main objective of these efforts to reduce poverty by making the markets work for the poor? In this case, collective action may be a phase in market development, an important means to an end of improving the welfare and broadening the scope of opportunities for millions of small farmers. For now, there is evidence that while collective marketing works for some of the poor and in certain situations, it is not a panacea for the pro-poor development agenda.

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