



Public–private partnerships and collective action in high value fruit and vegetable supply chains

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ARTICLE INFO

Article history:

Accepted 2 October 2008

Keywords:

Food safety
Supply chain management
Public–private partnerships
Collective action
Public and private standards
Traceability

ABSTRACT

Accessing developed country food markets entails meeting stringent food safety requirements. Food retailers impose protocols relating to pesticide residues, field and pack house operations, and traceability. To enable smallholders to remain competitive in such a system, new institutional arrangements are required. In particular, public–private partnerships can play a key role in creating farm to fork linkages that can satisfy market demands for food safety, while retaining smallholders in the supply chain. Furthermore, organized producer groups monitoring their own food safety standards through collective action often become attractive to buyers who are looking for ways to ensure traceability and reduce transaction costs. This paper compares the ways in which small producers of fruits and vegetables in Kenya and India have coped with increased demands for food safety from their main export markets.

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Introduction

Food safety has received heightened attention in both developed and less developed countries in recent times. This stems from the increased demand for safe food by households with rapidly rising incomes, technological improvements in measuring contaminants, and increased media and consumer attention on the risks of food borne illnesses. In response, many food retailers and food service firms, particularly in developing countries, have adopted private protocols relating to pesticide residues, field and pack house operations, and traceability. Likewise, governments in both developed and less developed countries have responded with voluntary and occasionally mandatory food safety programmes.

While the development of food safety standards has reduced the risks from foods, it has often increased the costs of compliance and sometimes incurred temporary import bans. The costs associated with compliance can potentially exclude small farmers who face four distinct problems: (1) how to produce safe food; (2) how to be recognized as producing safe food; (3) how to identify cost-effective technologies for reducing risk; and (4) how to be competitive with larger producers (Narrod et al., 2005). Given the perishable nature of high value agricultural products (HVAPs)

and the demand for quality and safety attributes, relationships, networks, skills, and coordination mechanisms are needed to manage the flow of products through the supply chain so that quality specifications are met.

The existing literature presents wide-ranging evidence of the inability of smallholders to meet market requirements for food safety in HVAP markets (for example, Reardon and Berdegue, 2002; Ghezan et al., 2002). While there is no denying that the short-term impact of food safety standards has been to exclude smallholders, cases exist where, given institutional support and sufficient time, some smallholder systems have been able to successfully participate in high value markets (Minten et al., 2005). Berdegue (2001), Boselie et al. (2003) and Henson et al. (2005) also provide examples of technological (for example, cooling facilities) and organizational arrangements (producer groups in contractual arrangements with the exporters) that allow smallholders to access high value export markets.

Such cases, though rare, are important for identifying the mechanisms that help retain smallholders in markets with stringent food safety standards. This paper adds to the case-studies of successful participation of small farmers in high value export markets. In particular, this paper focuses on the changes that food safety standards bring about in the institutions of collective action and public private partnerships.

The two cases that we focus on here are Kenyan green beans exports and grape exports from India. These two cases are well suited

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to identify the organizational changes following the tightening of the food safety standards. In both cases collective action in the form of producer groups existed prior to the food safety shocks. The imposition of tighter food safety standards—in levels of standards or in terms of high consignment rejections—led to significant organizational changes, resulting in new forms of collective action that try to minimize the asymmetries in information across principal (exporter) and agent (the farmers).

The role of collective action (in terms of producer groups) and public–private partnerships in enabling smallholders to access high value markets is well established in the literature (see the papers on successful cases above). Food safety standards alter collective action in two principal ways that we capture in the cases studied in this paper. First, beyond the organization into producer groups to achieve scale economies, collective action in the presence of food safety standards gets increasingly driven by differences in comparative advantages; an example of this would be collective action between a group of farmers and agents with expertise in marketing. Berdegué (2001) refers to it as a multiple agent framework.

Second, food safety standards necessitate the role of collective action in solving information asymmetry problems; for example, group composition may be chosen to solve adverse selection problems, and group monitoring may be used to solve moral hazard problems. The conventional role of collective action, i.e. exploitation of scale economies, also applies with food safety standards: traceability, which is central to the system with food safety standards, is more economical to achieve collectively.

Apart from highlighting the economic rationale behind the organizational changes in collective action and public–private partnerships, this paper emphasizes the complementarity between the two arrangements in determining the outcomes. There are independent roles as well for these arrangements, but there are crucial complementarities that food safety standards bring about. The best example is lumpy investments where pooling of resources by farmers can defray costs, but is often insufficient unless other parties extend funds through interlinked arrangements or through a loan subsidy. Similarly, as the Kenya example shows, government might play a role in organizing members to deal with the problem of free riding in the initial stages of formation.

The paper is organized as follows. First, we look at the delivery of fruits and vegetables to markets with food safety standards and discuss the implications for smallholders. We then show how supply chains incorporate food safety requirements in the two cases. The role of various institutions in ensuring that smallholders meet food safety standards is described next. Finally, we conclude with a discussion of the policy messages from these cases.

Delivering to markets with food safety standards

Typically, in most less developed countries producers supply three markets: the domestic traditional, modern urban, and export. These markets differ in organizational respects, but a large part of the difference is due to varying demands for food safety (World Bank, 2006). For instance, in traditional markets there is little consumer awareness or concern over food safety resulting in little effort to control it. In emerging modern domestic urban markets, however, there is growing consumer awareness regarding food safety. Increasingly, retailers in less developed countries attempt to control standards and thus differentiate their products in terms of food safety attributes. In export markets, especially in developed countries, there is a high level of consumer concern regarding food safety, as well as pressure on retailers to differentiate, resulting in strict retailer requirements imposed on suppliers.

In the emerging food system dominated by domestic urban and export markets, smallholders are at a disadvantage mainly due to their scale. The problem of coordinating with many small farmers is exacerbated by their geographic dispersion, low educational levels, and poor access to capital and information (Humphrey, 2005; Rich and Narrod, 2005). Because of the high transaction and marketing costs of sourcing from smallholders, major exporters produce high value agricultural products on their own farms or source from medium and large outgrowers trained and trusted to deliver on both traceability and food safety requirements.

Smallholders face problems in meeting the standards, as well as in delivering a regular supply to buyers, due to a number of inter-related factors:

- *Scale*: Compliance with standards incurs high fixed costs in production and marketing, compounded by poor access to credit.
- *Information*: Smallholders need information on safe use of inputs and management of pathogens, which can multiply as products move along the supply chain. Lack of information regarding production and marketing can especially deter smallholders, as acquiring and processing information involves large fixed costs.
- *Reputation*: For goods where some aspects of quality are not revealed immediately at the time of consumption, reputation of the sellers matters significantly. Smallholders usually have a short history of presence in the market and lack branding or reputation. This translates into a lack of incentives for an individual farmer to invest in quality improvement.

Given these constraints, the common effect of market requirements in high value markets has been to exclude smallholders. However, over time and given adequate institutional support, some smallholders continue to participate in high value export markets. Two institutional mechanisms for linking smallholders with high value export markets are collective action and public–private partnerships, which can play complementary roles as demonstrated by the case-studies in this paper.

The role of collective action

There are several definitions of collective action in the literature. Marshall (1998) defines it as an action taken by a group (either directly or on its behalf through an organization) in pursuit of members' perceived shared interests. Vermillion (1999) defines collective action as the coordinated behaviour of groups toward a common interest or purpose. Sandler (1992) considers collective action to arise when the efforts of two or more individuals are needed to accomplish an outcome. These definitions uniformly imply the objective of meeting a commonly shared goal, in this case achieving or retaining access to high value export markets by meeting stringent food safety standards. The economic rationale for collective action by smallholders derives from two features of markets with food safety standards: (i) economies of scale that are magnified by food safety standards, such as the requirement of traceability, and (ii) the need for specific skills for meeting the standards that smallholders may not have.

Collective action can create economies of scale in production and marketing. Farmer groups can achieve efficiencies in production (for example, through access to cheaper inputs) and can lower marketing costs. The implementation of food safety standards magnifies potential economies of scale by imposing marketing requirements, such as post-harvest cold storage, or specific transportation methods. Additionally, markets with high food safety standards are information intensive and rely on formal contracts, resulting in high transaction costs for collection of market information, negotiation, monitoring, and enforcement of business

Table 1
Food Safety Standards and the role of Collective Action.

Supply chain process	Role played by collective action ^a
Pre-harvest	<i>Procurement of information about markets and the process of contract formation</i> <i>Dissemination of information relating to food safety standards</i> <i>Undertaking lumpy investments</i>
Production	<i>Procurement of cheaper inputs through bulk buying</i> <i>Accessing extension services</i> <i>Establishment of traceability systems</i> <i>Maintaining a group monitoring system</i>
Post-harvest and marketing	<i>Collective marketing leading to reduced costs</i> <i>Grading and certification</i> <i>Collaboration with marketing experts</i> <i>Maintaining a group monitoring system</i>

^a Italics denote the roles played by collective action that specifically relate to food safety standards or that are significant compared to traditional markets.

transactions (Jaffee and Morton, 1995) that also entail significant economies of scale.

Table 1 summarizes the specific roles that collective action can play in facilitating smallholders' access to high value markets with food safety standards. Export supply chains that involve food safety standards may entail specific requirements, such as the need for information about market demands and the terms and conditions of contracts. The process of establishing contracts can itself lead to high transaction costs. The traceability requirements inherent in markets with food safety standards and the need for pre- and post-harvest monitoring can be facilitated by collective action. The costs of establishing traceability systems among smallholder producers are reduced by collective action. Additionally, farmer groups that implement internal group monitoring schemes transfer some of the monitoring costs away from the buyers, facilitating links with smallholders.

The role of public–private partnerships

In addition to collective action, public–private partnerships can play a complementary role in linking smallholders with high-value markets. Although the concept of public–private partnership does

not have a single definition, the term is used in this paper to mean a cooperative venture between the public and private sectors built on the expertise of each partner that best meets clearly defined goals through the appropriate allocation of resources, risks and rewards (Bettignies and Ross, 2004). The need for smallholders to meet food safety standards may form the basis for such partnerships. Thus, roles that were traditionally played by the public sector (for example, extension services) can benefit from being transferred to, or shared with, the private sector. Similarly, where the private sector has played a dominant role (for example, in lending), the magnitude of borrowing and long development phase suggest that the public sector might play an important role (through credit subsidy), especially in the initial period while linkages evolve. Partnerships could be instrumental in meeting infrastructural requirements that are lumpy or have public good characteristics, for example, in construction of highways, ports, irrigation and other infrastructure. Here, we focus on the roles of public–private partnerships specific to high-value agricultural markets with food safety standards (Table 2).

Case studies: food safety attributes in two supply chains

This section examines the critical food safety points along supply chains involving smallholders for fruit and vegetable exports in Kenya and India. In the Kenya green bean case, smallholders were producing beans for export for some time prior to the relatively recent demands for food safety. Smallholders were linked to export markets through producer-run cooperatives, which implemented a number of measures to assure retailers of compliance with food safety standards. In the Indian grape case, Mahagrapes is the marketing partner for a number of farmer cooperatives. These were built upon an existing network of producer organizations that were already producing good quality and organic grapes, but lacked the marketing expertise for export. Following an initial setback, the small grape growers in the cooperatives partnering with Mahagrapes have consistently met western markets' food safety standards.

Green bean production in Kenya¹

Currently, green beans in Kenya are marketed through three chains – export supermarket, export wholesale and domestic (Fig. 1). These chains are distinguished by the degree of coordination based on food safety standards and the demand for traceability. Most of the exports go the United Kingdom (UK).

In Fig. 1, the dashed lines represent traceability requirements. The circles (grading sheds) depict the final stage of screening for the beans before they are packed for export. The UK supermarket chain imposes the most stringent food safety standards (Jaffee, 2003; Henson et al., 2005); it requires third party certification from EurepGAP,² British Retail Consortium (BRC) and, in most cases, retailers' private food safety protocols. The beans must also be accompanied by a phytosanitary certificate issued by a competent authority. In addition, beans must satisfy traceability requirements; the dashed lines link all the way back to the farms, whether large or small. For smallholders, traceability is mediated through the smallholder outgrower groups.

¹ From Okello et al. (2008).

² EurepGAP (now called GlobalGAP) is a private sector body that sets standards for the certification of agricultural products around the globe. It is a pre-farm-gate standard, which ensures 'Good Agricultural Practices' (GAP) from before the seed is planted until it leaves the farm. The main aim of GlobalGAP is to achieve consumer confidence in food quality and food safety. To maintain credibility, GlobalGAP does not conduct the certification process itself. Only authorized third party certification bodies can give GlobalGAP certification. These bodies do audits regularly to see if conditions for certification are being met.

Table 2
Public and private sector roles in supply chain management of HVAPs.

Supply chain support processes	Possible roles for public–private partnership
Extension and information services	Knowledge of specialized techniques for high value agriculture, markets (prices), rules and regulations in private and public sectors could be complementary Public sector could subsidize costs of information about food safety standards and other market requirements for smallholders
Infrastructure development	Manage flows between chain links quickly and efficiently; reduce distribution costs to remain competitive. This requires public (roads, ports, storage facilities) and private (processing, storage, logistics, etc.) infrastructure that could be provided through partnerships
Certification, grades, and standards	Consistent, credible application of standards on food safety and quality specifications. Establishment of certification agencies that provide affordable services to smallholders could require public–private partnerships. Government could influence formation of standards (jointly with private sector) customized to the needs of smallholders
Coordination mechanisms	Public sector responsibility for regulation to ensure competition and enforcement of contracts could be developed jointly with the private sector and smallholders

Source: Adapted from Rich and Narrod (2005).

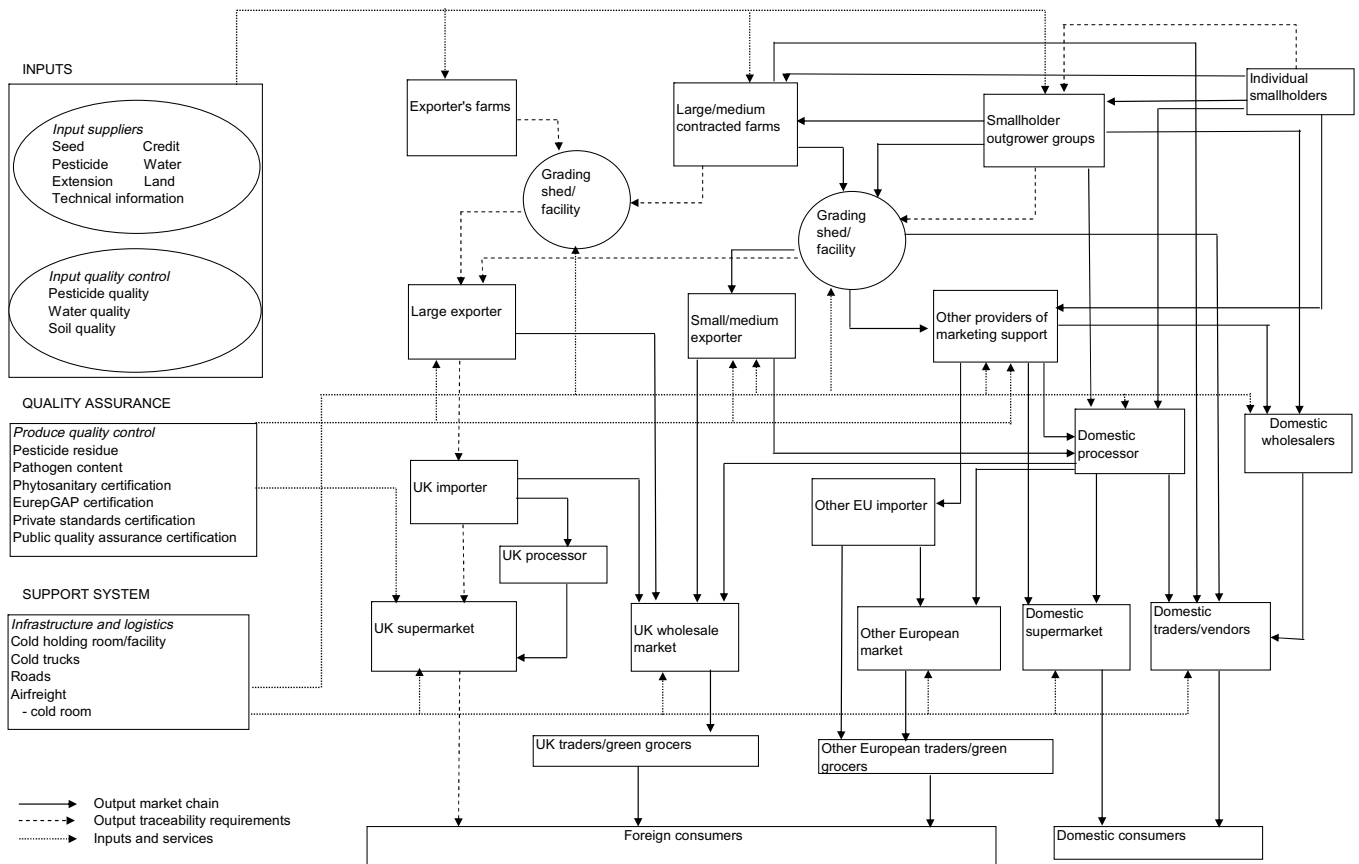


Fig. 1. Kenya's green bean supply chain.

Most smallholders, however, primarily supply the export wholesale chain and the domestic institutional sector (hotels, restaurants, hospitals, etc. included in Fig. 1 under 'domestic consumers'). In the export wholesale chain, beans are screened for safety and quality at the grading shed to meet the EU's public standards, but traceability is not required. Some small and medium farmers have shifted to producing for the bean canning industry where the only food safety standard applied is the pesticide residue limit. To meet this, exporters choose their own team of pesticide applicators and handle the purchase and storage of pesticides themselves.

Focusing on the supermarket chain, handling and hygiene practices during harvesting, grading and packing are all closely monitored. Growers are required to provide a toilet, pesticide storage unit and a facility for hand washing at the farm and/or grading shed. Exporters to the EU supermarkets test the water and soil twice a year for pathogens and require farmers to keep records—individually or collectively in case of a farmer group—of the type and quality of inputs (pesticides, water or soil) used. These records accompany the beans to the exporters' pack houses. In order to enforce compliance with these practices, EU importers have increased their monitoring of input use. They generally monitor the exporters, expecting them to monitor growers in turn, but in some cases direct monitoring has been extended to the farm level.

The most serious attention to the possibility of contamination occurs in the exporters' pack houses. Exporters in this chain have all invested in pack houses implementing good manufacturing practices. Workers are required to wear special clothing and rubber boots in the pack houses, and to wash their hands at regular intervals or when they change shifts. Some exporters monitor worker hygiene in the pack house by randomly swabbing workers' hands and testing for pathogens. If the swab tests positive for any of

the pathogens of concern, the worker is penalized. All containers used at various stages of processing are colour-coded to avoid mixing and cross-contamination with pathogens. In addition to strict adherence to hygiene during processing, which involves sorting, chopping and arranging beans into trays, packing and bar coding are done under temperature-controlled conditions.

Small exporters are disadvantaged by these pack house restrictions. Consolidation of pack houses impacts suppliers, as larger exporters have a greater incentive to bypass smallholders due to their supply requirements and the need to secure their large investments.

Grape exports from India³

India is the second largest horticultural producer in the world but a failed exporter of horticultural produce. India's horticultural exports are largely inhibited by the inability of the smallholder dominated production system to meet western food safety standards. However, one unique success story in horticultural exports from India is Mahagrappes, the marketing partner of a group of producer organizations.

Mahagrappes came into existence in 1991. The creation of Mahagrappes is unique in the Indian context as it is the first to make use of an amendment under the cooperative laws of the Maharashtra State in India. This amendment allowed cooperatives to associate with other agencies including previously forbidden marketing partners. Initially, 29 grape growing farmer cooperatives were members of Mahagrappes, but the number fell to 16 within three years. Several cooperatives parted with Mahagrappes and refocused

³ From Roy and Thorat (forthcoming) in World Development Report.

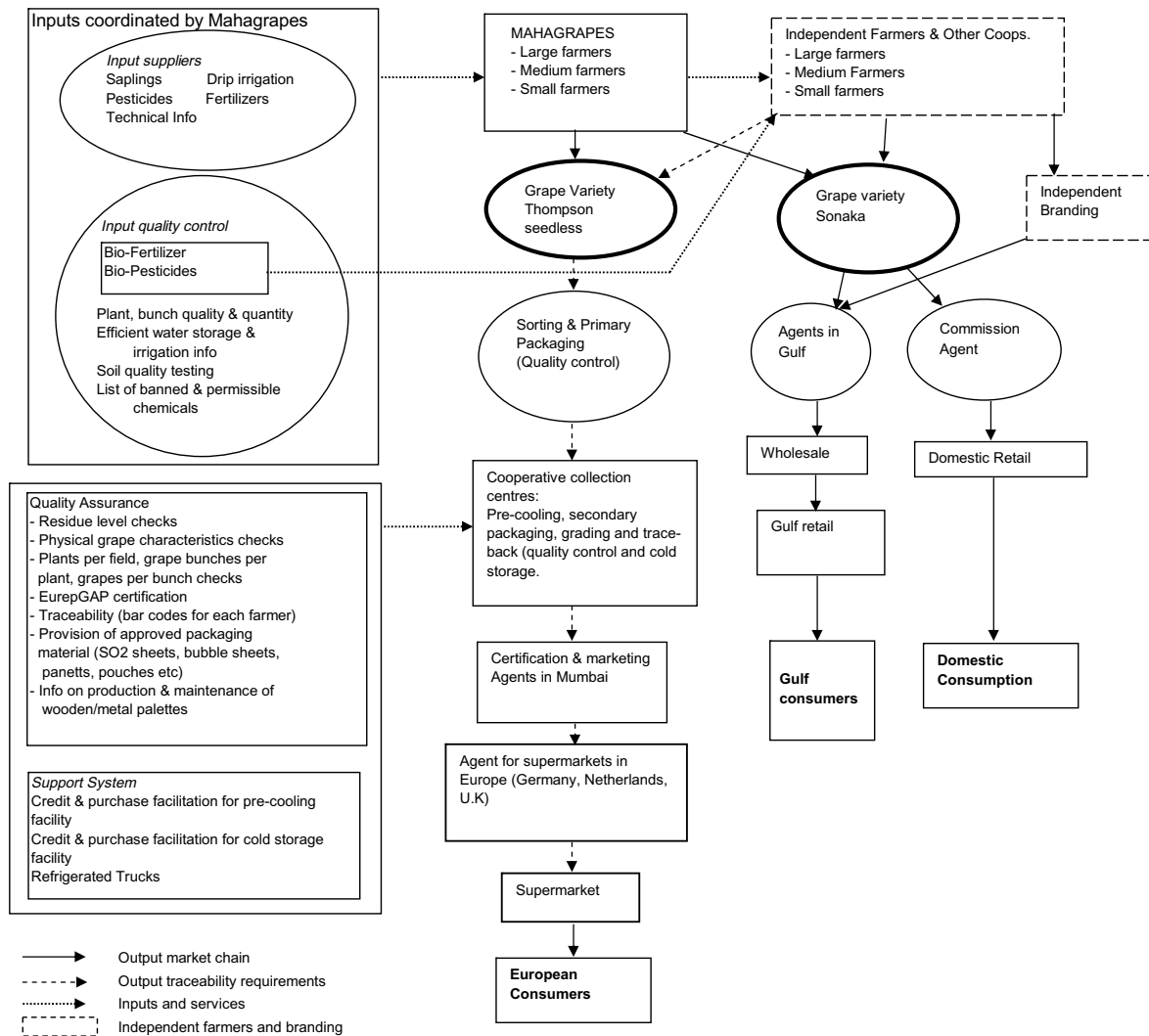


Fig. 2. Supply chain for Mahagrapes and independent grape producers.

on domestic markets after persistent consignment rejections. Over time, the consignment rejections have decreased significantly, to a current average of less than 1%.

Fig. 2 shows the supply chain for two of the three main varieties of grapes: Thompson seedless and Sonaka. The first variety is targeted mainly for export to European markets, while Sonaka is marketed to the Gulf and some other countries. Sharad seedless, which is not represented in Fig. 2, is mainly targeted for domestic markets. Exports to the Gulf and Sri Lanka require only simple packaging in farmers' own sheds, which is not shown in the figure.

Traceability requirements (the dashed lines) are applicable only for the Thomson seedless variety grapes that are exported to Europe. The circles represent points where the product may be rejected. The reasons for rejection could, however, differ depending on the final market destination: European, Gulf or domestic.

In the supply chain for Thompson seedless, food safety standards impose restrictions on production techniques (for example, types of fertilizers and pesticides) as well as on marketing methods (for example, the type of boxes for shipping, maintenance of the cold chain and hygiene in pack houses). Post-harvest facilities needed for compliance with food safety standards, such as pre-

cooling facilities, require lumpy investments and all facilities must meet EurepGAP sanitation and hygiene requirements (see Roy and Thorat, forthcoming, for details of food safety standards for grapes in European markets).

The role of institutions in maintaining smallholders' market access

In the early-1990s before food safety standards were imposed, Kenya's green bean industry was dominated by smallholders: their share of output was estimated at over 60% (Kimenye, 1993). After the imposition of stringent food safety standards, in the short term their share was estimated to fall sharply, to less than 40% (Dolan and Humphrey, 2000; Jaffee, 2003). Similarly, many Indian farmers parted with Mahagrapes after the initial food safety shocks.

Although the exclusion effect on smallholders in the short term is common to both cases, some smallholders have continued participating in these chains and meet extremely stringent food safety standards. In this section, we discuss the institutional mechanisms (collective action and public-private partnerships) in the two cases that helped retain smallholders in high value agriculture by addressing scale, information and reputation problems, respectively.

Collective action and public–private partnerships in Kenya

In Kenya, farmer groups existed prior to the food safety standards, mainly for the purpose of marketing, i.e. to find a buyer and negotiate better prices for members. Traditionally, firms' linkages with smallholders have been solely through procurement from farmer groups. This system is quite common as a means of reducing the transaction costs of dealing with many smallholders individually (Chowdhury et al., 2005), for example, in reducing the costs of implementing a traceability system.

During the late 1990s, with the imposition of the food safety standards, the organization of farmer groups changed to satisfy the need for compliance with standards. The reorganization of farmer groups was induced by the exporters who continued to purchase from smallholders (Jaffee, 2003). This transformed the nature of collective action among farmers.

As part of the reorganization, the farmer groups were reduced in size to fewer than 30 members per group (from as many as 350 farmers), primarily to facilitate third party monitoring. Further, farmer groups assumed the role of group monitoring themselves in order to share the costs with buyers. With dispersed and numerous smallholders, monitoring costs would otherwise be a strong deterrent for buyers. In order to implement group monitoring, a system of penalties for violations of the rules was needed. Group size was further determined by the need to train farmers in the technical requirements of the standards, which is less effective if the group size is excessively large. Hence, after implementation of the food safety standards, third party monitoring, internal group monitoring and training jointly determined group sizes.

Apart from group size, the constitution of members became critical when the group as a whole was held responsible for compliance with the standards. Membership is, therefore, controlled, and new members must undergo screening before becoming eligible to join. Typically, a prospective member must be recommended by at least one existing member. The conduct of the applicant in other social or economic organizations is discussed by members, followed by a vote to accept or reject the applicant.⁴ The farmer groups are run by an elected committee that enforces the group rules, negotiates contracts with exporters, and is responsible for enforcing compliance with food safety standards. All farmer groups are financed by members' contributions.

Collective action also continues to fulfil more traditional roles in farmer groups, albeit modified to meet the food safety standards. Thus, farmers in a group minimize their costs through bulk purchase of inputs or joint hiring of technical experts and clerks who facilitate compliance. The technical expert keeps records for all members of the type, amount and date of pesticides used, and occasionally conducts field visits with an exporter's agronomist. The clerk, on the other hand, enforces compliance with hygiene requirements within the grading shed and maintains records to ensure traceability. Some producer organizations also hire a team of expert pesticide applicators, again paid for by farmers as a group. Further, through producer organizations, smallholders jointly make investments, such as cold storage and grading facilities, toilets and pesticide storage units.

Hence, some of the problems of scale (hiring services, lumpy investments, monitoring costs, traceability), information (hiring technical experts) and reputation (third party certification, group monitoring, enforcing traceability) have been addressed through collective action among farmers.

Collective action was supplemented with other public–private partnerships. Obtaining third party certification, employing technical experts, developing infrastructure or having access to information are indeed less costly for farmers through collective action, yet they could still remain out of reach for smallholders. Public–private partnerships have thus proliferated to provide information and financial support, and build capacity (e.g. training for smallholder group leaders) in areas including auditing and certification of EurepGAP compliance.

The first public sector intervention occurred in the formation of producer organizations themselves. Formation of a producer organization entails *ex ante* transaction costs related to search and screening of members. Negotiations over the size, membership fee, leadership, penalties and benefit sharing entailed further costs, especially when the farmer groups were reorganizing. Formation of some smallholder organizations was, therefore, facilitated by governments, exporters, NGOs and donors. For example, the Government of Kenya, in partnership with the Japanese International Cooperation Agency (JICA), established a fresh produce handling company, which mobilizes and recruits smallholders to form farmer groups.

Public–private partnerships have also helped by training group leaders in good agricultural practices and other export market requirements, whereby group leaders can act as EurepGAP internal auditors and service providers to smallholder groups. The partnership between the government and JICA has trained more than 100 group leaders as service providers, and several hundred smallholders belonging to farmer groups have been trained on good agricultural practices.

Similarly, a partnership between the Business Management Service Development Project (BMSDP) of the UK Department for International Development (DFID) and the Horticultural Crops Development Authority (HCDA) has trained a pool of horticulture service providers to serve smallholders. The BMSDP is supporting the formation and registration of the Association for Development of Horticultural Exporters of Kenya (ADHEK), which aims to help small exporters comply with EurepGAP, establish workable systems of traceability, and achieve reliable access to high-end European markets. Since ADHEK members source beans from smallholders, it is to their benefit to support smaller farmers in meeting and demonstrating compliance with food safety standards. The BMSDP also works with other partners, particularly the Kenya Horticultural Development Project, to promote the formation of producer marketing organizations and provide EurepGAP training and certification.

If the cost of obtaining certification is high, then it can exclude smallholders even when there is collective action. To address this, donors and NGOs have jointly established Africa's only indigenous certification company, which is aimed at decreasing the cost of EurepGAP, thus making it more accessible to smallholders. Public–private partnerships have also been instrumental in lobbying EU supermarkets to recognize the ability of smallholders to meet EurepGAP standards.

Three NGOs, namely Care International (Kenya), Reach the Children Inc., and ICIPE (African Insect Science for Food and Health), have partnered with private firms to train, audit and/or provide financial aid for small-scale green bean farmers seeking to obtain EurepGAP certification. In addition, ICIPE is currently working with green bean exporters to train EurepGAP trainers and other horticultural industry service providers. Public–private partnerships could also provide supplementary funds for lumpy investments or even provide infrastructure in targeted areas themselves. Thus, the company established by the Government of Kenya in partnership with JICA owns cold storage facilities in areas where a large number of smallholders grow fresh vegetables.

⁴ Importantly, most smallholder groups in Kenya are currently not recruiting new members.

Compliance with standards by Mahagrapes farmers through collective action and public–private partnerships

The collaboration between farmer cooperatives (who have production skills) and a marketing partner (who has marketing skills in contract negotiation, market information, etc.) is an example of collective action based on differences in comparative advantages. Kleinwechter and Grethe (2005), while analysing the adoption of EurepGAP standards by mango exporters in Peru, differentiate the compliance process into three stages: an information stage, decision stage and an implementation stage. In the decision stage,

Mahagrapes holds workshops where information about the standards is provided to farmers and grape handlers/sorters. The cooperatives and Mahagrapes regularly jointly update the list of banned and approved pesticides, fertilizers and chemical residues, which vary with time and across markets. This information is published in a yearly handbook in the local language and distributed free to members. Because acquiring a EurepGAP certificate individually is costly for small farmers, Mahagrapes provides cooperatives with this certification. This certification is only valid as long as farmers are linked with Mahagrapes.

In the implementation stage, Mahagrapes provides materials and technical help along with infrastructural support to the farmers. Penalties for non-compliance with the rules are applied to the entire cooperative, creating an incentive for farmers to monitor each other. Additionally, the cooperative hires a trained technical expert to implement third party monitoring and enforce compliance.

In line with the traditional benefit of collective action for small farmers, cooperatives benefit from lower costs for the inputs needed for compliance with the standards. Mahagrapes consolidates the input demands of all the cooperatives and thereby obtains inputs at lower costs than is possible for each cooperative separately. Thus, for the purchase of specific inputs, such as bio-fertilizers that have to be imported, Mahagrapes scouts for the best prices and negotiates with the sellers on behalf of the farmers. A similar role is assumed by Mahagrapes in the case of other inputs such as packaging materials.

Some other inputs such as bio-fertilizers are produced by Mahagrapes itself and provided to farmers at below market rates along with others that are imported. These inputs are also sold to non-members but at higher prices, implying cross-subsidization.

As in the case of green beans, the collective action for grapes has also been complemented with public–private partnerships. In light of the poor reputation of Indian horticultural exports in international markets, the private sector was unwilling to venture into export markets procuring from a large number of smallholders. Thus, government support was crucial in the establishment of Mahagrapes, even to the extent of covering the initial salaries of the board members. The government also played an important role in funding the travel of farm group leaders to technical workshops and exhibitions both within the country and outside. This was instrumental in demonstrating to farm leaders that there was an opportunity for them to export.

Further, both Mahagrapes and government bodies provide extension services to the farmers. Regular monitoring of the grape plants is provided by scientists from the National Research Centre (NRC), a government agency that also trains technical leaders. The government also provides a transport subsidy to Mahagrapes, although this is not exclusive, being provided to all Indian horticultural exporters.

The most important role played by the government was in the initial stages where food safety standard shocks occurred and several consignments were rejected. The government body, the National Cooperative Development Commission (NCDC), provided subsidized credit to the cooperatives for the installation of post-

harvest facilities that were crucial in bringing down the consignment rejection rates substantially.⁵ Cooperatives linked with Mahagrapes, with partial financial aid from the state government and partial self-financing, have installed pre-coolers and cold storage at all 16 cooperative headquarters. Mahagrapes and the cooperatives could not obtain funds (internally or through credit markets) to undertake these lumpy investments in light of their restricted access to credit, compounded by the poor reputation of horticultural exports from India.

Policy lessons and conclusions

Two policy lessons emerge from these cases. First, over time, given adequate institutional support, smallholders can cope with stringent food safety standards. The existing pessimism regarding smallholders' participation in markets with high standards may thus reflect the limitations of researchers and policy practitioners in identifying solutions, as several cases of small farmers' successful participation in high value markets exist beyond the two cases covered here.

These two cases show that collective action and public–private partnerships, especially in the initial stages, can play a significant role in ensuring that smallholders are not excluded. Food safety standards, however, require changes in the forms of collective action. As with group monitoring schemes in micro-lending, food safety standards require changes to group size and composition. Policies should support, or at least permit, such reorganization in the private sector.

Since selling in markets with food safety standards requires considerable market knowledge, farmers' groups need to be able to work with other agents who can provide appropriate expertise. In several places, for example in some states in India, cooperatives are prohibited by law from forming external linkages. In markets with food safety standards, the importance of such linkages cannot be underestimated.

As a partner to the private sector, the government has a complementary role to play. There is a need for the government to correct specific market failures in the chain but not to protect the chain itself. Thus, in both the Kenya and India cases, farmers are still linked with private agents while government acts as a facilitator. Given the wide evidence of rent seeking and elite capture in farmer groups that have strong political affiliations, this separation is considered important.

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⁵ In the early years of exports, consignment rejection rates were at times greater than 80%. At present, Mahagrapes claims a negligible rate of rejection.

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