



Josef G. Knoll-Europäischer Wissenschaftspreisträger 2010

Josef G. Knoll-European-Science Award Winner 2010

Solomon Asfaw “Global Agrifood Supply Chain, EU Food-safety Standards and African Small-scale Producers – The Case of High-value Horticultural Export from Kenya”, University of Hanover, 2008

Summary

Many sub-Saharan African countries have been diversifying their export portfolios away from primary commodities into non-traditional high-value crops to increase their export earning and as a pro-poor development strategy to reduce poverty. Several studies have documented the positive contribution of the horticultural export sector in reducing poverty. However, there are concerns that the proliferation and enhanced stringency of food-safety standards that are imposed by high-income countries can negatively affect the competitiveness of producers in developing countries and impede actors from entering or even remaining in high-value food markets. In parallel with changes in official standards, supermarket chains in Europe have developed prescriptive, production-oriented standards, e.g. the European Union Retailers Produce Working Group for Good Agricultural Practices (GlobalGAP), and are asking their suppliers for produce to be certified according to food-safety and quality standards.

Compliance to these standards for developing countries small-scale producers necessitate costly investment in variable inputs and long term structures. Thus unlike larger commercialized farms, smallholder farmers are faced with financial constraints and human resources limitations in complying with standards. Consequently, small-scale producers, which are the very target of many agricultural development programs that aim at poverty reduction in line with the first Millennium Development Goal (MDG), could become losers of this development. Yet, in some cases, others argue that such standards can play a positive role, providing the catalyst and incentives for the modernization of export supply and regulatory systems and the adoption of safer and more sustainable production practices. The central item of this research is therefore to test these propositions using data collected from Kenyan small-scale vegetable producers.

The overall objective of this study is to investigate the impact of the most widely known private standards, GlobalGAP standards, on small-scale vegetable producers' welfare in Kenya. From the general objective, five specific objectives are defined and analyzed in separate chapters. These includes i) investigate the nature and magnitude of costs of compliance with GlobalGAP standards, ii) examine determinants of adoption of GlobalGAP standards and estimate its impact on farm financial performance, iii) examine the impact of GlobalGAP standards on pesticide use and farm-level productivity; iv) estimate the effect of GlobalGAP standards on pesticide ascribed incidence of acute illness symptoms and its associated cost-of-illness and, v) explore impact of GlobalGAP adoption on improved management practices as proxy for environmental benefits.

To generate the empirical basis for this study, data collection was conducted at vegetable

grower level. A multi-stage sampling procedure was used to select districts, sub-locations and small-scale vegetable producers, respectively. The first stage was to select five districts purposively from the two major vegetable producing provinces (namely Nyeri, Kirinyaga, and Murang'a Districts in Central Province and Meru Central and Makueni Districts in Eastern Province). Selection was based on the intensity of export vegetable production, agro-ecology, types of crop produced and accessibility. Since the size of export vegetable producers among the districts vary and to ensure that every element in the target population has an equal chance of being included in the sample. Probability Proportional to Size (PPS) sampling technique is used. Lists of all smallholders in export production, which were compiled as an update on smallholders participation in export production at the sub-location level, served as a sampling frame for this study. Overall, 21 sub-locations were randomly selected from the five districts by PPS sampling technique and a total of 539 vegetables producer households were chosen randomly for the interviews. For each respondent the survey combined a re-call survey and season-long monitoring of crop production practices. The season-long monitoring data were collected for both dry (November 2005 to February 2006) and rainy season (May 2006 to August 2006). However the data collected during the first round monitoring survey (i.e. dry season) were incomplete due to prevalent drought in the survey areas. Thus, the dry season data set was excluded from the analysis and only the data collected during rainy season as well as the re-recall survey data were used for the analysis.

Different econometric models are applied to address the research questions. First, two-stage standard treatment effect model and propensity score matching techniques are used to investigate small-scale producers' decision to adopt GlobalGAP private production standards and examine whether investment in food-safety standards compliance pays off for small-scale producers. Next, the impact of standards on value of production and pesticide use are investigated by applying three-stage damage control production framework that enables to control for a multiple endogeneity problem. Finally, health and "environmental impact of adopting standards are evaluated by making use of a two-stage Poisson regression model and two-stage standard treatment effect model.

The results of the study can be summarized into three major categories. First, smallholders as compared to large-scale farmers face difficulties in complying with the standards due to a range of constraints. Results show that access to information, capital, services and availability of labor are major factors influencing the ability of small-scale producers to adopt standards and exploit export opportunities for agricultural and food products in developed country markets. Standards do not however eliminate smallholder farmers as a whole from export markets but they discriminate within the group of smallholder producers. Hence, the results support the findings of studies which submit that resource poor farmers with limited access to information and services face difficulties to comply with certification schemes. On the other hand small-scale farmers who do adopt the standards enjoy a range of benefits including higher net-income and stronger bargaining positions with exporters. The financial internal rate of return on investments in standards compliance at farm level is remarkably high even when pessimistic assumptions are made. The pay off period analysis demonstrates that smallholders can recover their investment cost in two to three years if they plant three crops a year and up to seven years for two cropping seasons. Comparing the financial internal rate of return to the medium term lending rate by banks in Kenya, it is reasonable to conclude that investment in standards compliance pays off for small-scale producers in Kenya even in the absence of external support.

Second, there is indication that adoption of standards can induce positive changes in production systems of small-scale farmers. Estimation results show that farmers producing vegetables for the domestic market use significantly lower quantities of pesticides than do export farmers. However, contrary to findings elsewhere, the econometric evidence here shows that both domestic and export-oriented vegetable farmers in Kenya use pesticides at levels below the economic optimum. The results also show that the adoption of standards by export farmers does not have any significant impact on total pesticide use. However, adopter categories are distinguishable in terms of types of pesticide used, i.e. adopters use safer pesticides based on World Health Organization (WHO) classification. The third-stage structural revenue model results demonstrate that adoption of standards has a positive and significant impact on revenue raised in vegetable production. Nevertheless, farmers producing for the export market are indistinguishable from those producing for the domestic farmers in terms of the total revenue earned from producing vegetables during the rainy season, on a 'per acre' basis. Although standards can potentially prevent resource-poor smallholders from maintaining their position in the lucrative export markets, they can also result in positive changes in the production systems of those small-scale farmers who adopt it, as shown by these results.

Third, results show that adoption of production standards reduces production externalities such as pesticide ascribed incidence of acute poisoning symptoms and its associated cost-of-illness. *Ceteris paribus*, farmers who adopt standards experience 78% lesser incidence of acute illness and spent about 50% less on restoring their health compared to non-adopters. Although the health costs examined in this study are limited to treatments related to a few visible acute health impairments (which could be just a small part of the total health cost), they still account for about 86.4% of the mean household chemical expenditure per cropping season for non-adopters and 39.6% of adopters. Likewise adoption of standards has a significant positive impact on improved crop management practices, for example safer and environmentally more benign pesticide use, which is likely to reduce external costs of production.

Given the ability to invest in required structures, the results of this study generally support the notion that smallholders can enjoy substantial financial and non-financial benefits from adopting emerging private standards. Adoption of emerging food-safety standards can serve as a catalyst in transforming the production systems of developing countries towards safer and more sustainable production. However, the question is whether many small-scale farmers in developing countries at large and in Kenya in particular can finance the initial investment cost in year zero to start up the implementation of the protocol and at the same time the donor/ exporter continue their financial and technical support. There is no question that by raising the bar for new entrants and placing a premium on effective safety management and logistical coordination, higher private standards can weaken the competitive position of the poorest among smallholders to remain active and profitable in export supply chains. But food-safety standards are here to stay, and there is no slowing down their rate of change or applying for special and differential treatment from export market.

The government and private sector can help farmers expand and upgrade their range of assets and practices to meet the new requirements of supermarkets and other coordinated supply chains. The options include public investments in increasing farmers' productivity and connectivity to markets, and public-private partnerships to promote collective action and build the technical capacity of farmers to meet the new standards. This would not only address the problem associated with standards rather it addresses the bigger question of

linking smallholders to emerging markets either domestic or export. In short developing countries need institutional frameworks to help them overcome the problems associated with being poor or small. Out grower programs for smallholder farmers and systems of training could be effective instruments. So far the role of donors tends to be significant in providing the necessary training and subsidizing the overall certification schemes.

Although the financial support by donors or private companies was crucial for smallholders to achieve certification as also presented chapter four, subsidizing GlobalGAP certification among smallholders may not be justified from a development perspective for a number of reasons. This does not mean that financial and technical support for small-scale producers is unjustifiable, but it requires further research that assesses the costs of helping a larger part of the smallholder population to achieve food-safety standards and compare these with alternative options for attaining poverty alleviation and rural development. For development agencies, first it's crucial not to only define the challenge in terms of the certification process but also the management systems that lay behind it. Certification is not the end in itself, but rather verification that a quality system has been put in place. Second, both the costs of certification and the costs of maintaining the quality system need to be emphasized. Third, the focus of donors should not be only on farmers and farmer groups rather the value chain linkages in the export horticulture business and the critical role played by exporters in securing access to those buyers that required GlobalGAP certification. There is no simple answer to these challenges. What is clear, however, is that as the requirements of export markets become more sophisticated exporters will play a critical role. There is merit in donors working with private companies and try to determine when their support provides genuine increase in aggregate output.

The opportunities of smallholders to remain viable in lucrative export market also grossly depend on the strategies chosen by export companies. It is apparent from the results that smallholders not well supported or contracted by their exporter have low probability of adopting GlobalGAP and that most either fail to certify or drop out of the compliance system within short period time. Therefore it is important that companies adopt strategic planning in their contract farming schemes to minimize the negative impact of enhanced standards on the poorest segment of the rural producers. Private companies may not have financial incentives to do so but there is the corporate social responsibility that implicitly binds them to act.

In the light of these challenges, considerations also need to be given to policies that shift small-scale producers away from the most demanding global markets. It's important for smallholders to diversify their product categories, invest on better post-harvest qualities and partake in domestic and south-south trade, the market that might be growing fast in the next two decades. From the standard setter point of view it is also crucial that the emerging private standards are/will be smallholder friendly, which is acceptable to both buyers and producers and could be implemented without a significant donor support.

Research Contribution for Poverty Reduction

Today, 1.1 billion people continue to live in extreme poverty on less than US\$1 a day. Another 1.6 billion live on between US\$1-2 per day. Coordinated action is required to accomplish the Millennium Development Goals and to enable more people to live in dignity. The first goal, to eradicate extreme poverty and hunger, in particular depends on raising the productivity of agriculture. However, in today's more integrated world economy, success in productivity-based agricultural growth crucially depends on the expansion of market

opportunities. Improving the competitiveness of African agricultural products in international, regional, and domestic markets is the key to expanding market opportunities. One strategy employed by many sub-Saharan African countries to achieve higher rates of growth in agriculture and to reduce poverty is diversification of export portfolios away from primary commodities into non-traditional exports like horticultural commodities with more auspicious market trends.

The expansion of markets and the liberalization of trade policies are providing new opportunities for rural people to escape poverty through production and exchange of non staple crops. Many studies have documented the significant positive impact of Kenyan horticultural industry on producers and the workforce employed in the sector. This is reflected in generation of employment in pack houses in urban areas, in farms owned or under contract by exporters as well as through the direct purchase from small-scale farmers. In addition, export vegetable production in Kenya is concentrated in areas severely affected by absolute poverty and hence is expected to contribute in poverty reduction. Nevertheless, the growing competition in export markets requires that African farmers meet more stringent demands for grades and standards and these might impede resource-poor farmers benefiting from the lucrative export horticultural market, which implies an obstacle for pro-poor development strategies.

Hence my research contributes to the goal of taking action for the world's poor and hungry people in four major ways. Research and the dissemination of its results are critical inputs into the process of poverty reduction debate and formulating sound and appropriate policies.

First, results of my research study has been presented in international conferences, policy workshops to stakeholders in Eastern African and to participants from the Food Industry and Supermarket chains from Europe in order to improve the producer consumer linkages on the global level. The findings could serve as an evidence to lobby on behalf of poor farmers in EU via discussion forums and publications. Second, it will provide a scientific basis for decision making of government organizations, NGOs, multilateral donors and research institutions for resource allocation in its horticultural research portfolio. Third, the horticultural industry in selected Eastern African countries will benefit from the research findings in identifying an appropriate support scheme, new institutional policies, and appropriate market development policies for introduction of legal and industry codes to assist small-scale producers to comply with required local and export standards. Fourth, the environmental and health effects of intensive horticultural production will be documented and an assessment of their associated external costs will provide the implementation base of policies and development of technologies that promote more environmentally benign production practices. Good horticultural policies and good agricultural practices (GAP) will make the Kenyan horticultural sector competitive and sustainable in the international market.

Solomon Asfaw: Global Agrifood Supply Chain, EU Food-safety Standards and African Small-scale Producers - The Case of High-value Horticultural Export from Kenya, Hannover, 2008, ISBN: 3-934373-14-3