
Sanitary and Phytosanitary Regulation: Overcoming Constraints

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I ncreasingly stringent food safety and agricultural health standards in industrialized countries pose major challenges for continued developing country success in international markets for high-value food products, such as fruit, vegetables, fish, meat, nuts, and spices. Much of the literature casts sanitary and phytosanitary (SPS) standards as a barrier to trade, because some appear to be thinly disguised protectionist measures or discriminate against certain suppliers, or because of the high cost of compliance. Yet, in many cases, such standards have played 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.

Much of the policy discussion pertaining to SPS standards and developing country trade centers on finding ways to increase the participation of developing countries in international standard-setting bodies, or otherwise influencing the level and nature of the standards themselves. If the standards were the problem, it would be logical to emphasize renegotiation of the rules of the game. But new findings from the World Bank's research program on SPS standards (appendix 1 and World Bank 2005) suggest that adjustment of standards represents at best a partial solution, and that the challenges and opportunities posed by standards can be better addressed by strengthening public and private capacities to manage food safety and agricultural health risks.¹

According to the findings, developing countries faced with rising SPS standards in their export markets can maintain and improve market access, position industries for long-term competitiveness, mitigate potential adverse effects on vulnerable groups, and improve domestic food safety and agricultural productivity by adopting a strategic approach to food safety, agricultural health, and trade. For well-prepared countries and suppliers, rising standards represent an opportunity; for those that are poorly prepared, they pose risks related to safety and market access. Rather than adopt differential standards or procedures for suppliers from different countries, high-income countries should increase development flows to help developing countries build their capacities to plan and execute the necessary strategies.

Growing trade in high-value food products

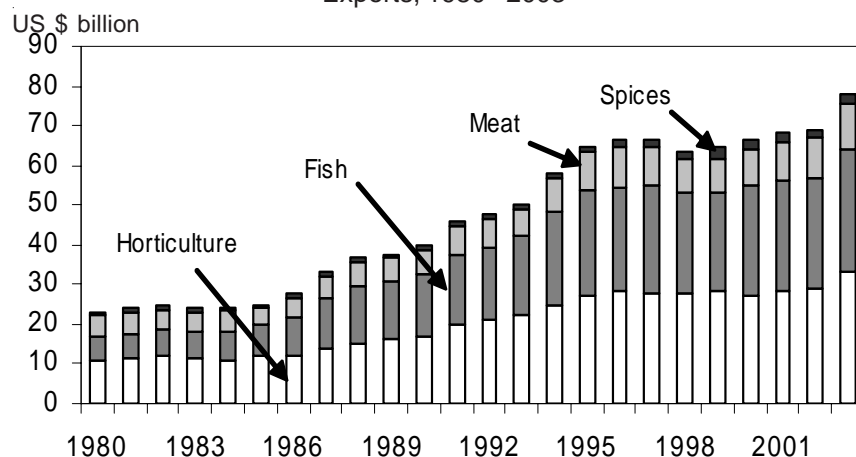
International trade in high-value food products has expanded enormously over the last decades, fueled by changing consumer tastes and advances in production, transport, and other supply-chain technologies. Developing countries have

successfully participated in this growing trade (figure 1). Fresh and processed fruits and vegetables, fish, meat, nuts, and spices now account for more than 50 percent of the total agro-food exports of developing countries, while the share of traditional commodities—such as coffee, tea, cocoa, sugar, cotton, and tobacco—continues to decline. Growing demand for differentiated products from increasingly sophisticated consumers, along with the growth of integrated international supply chains, will provide continuing opportunities for competitive suppliers of high-value foods by allowing them to target a market segment that suits their competitive profile.

Underpinning the growth in demand for high-value foods is the steady growth in the world's population. Demand for food of all types will increase dramatically in the next 20–30 years, as the world's population grows by two billion people—mostly in developing countries. Growing populations, increased wealth, and reduction of traditional trade barriers (through the Doha Round and thereafter) will promote rapid expansion in trade in high-value products worldwide and among developing countries—so-called South–South trade.

SPS standards have been important to the expansion of world trade in high-value perishable products because they have helped manage risks associated with the spread of plant and animal pests and diseases and the incidence of microbial pathogens or contaminants in food. In recent years standards have been tightened or extended into new areas in the wake of a spate of food scares in industrialized countries (table 1) and in the face of increased scientific knowledge, official concerns

Figure 1. Developing countries move into high value foods
Exports, 1980 - 2003



Source: FAOSTAT.

Table 1. Recent food safety events in industrialized countries

Year	Event	Country
1987-1988	Beef hormone scare	Italy/European Union
1988	Poultry salmonella outbreak/scandal	United Kingdom
1989	Growth regulator scare for apples	United States
1993	E.Coli outbreak in fast-food hamburgers	United States
1996	Brain-wasting disease linked to BSE (mad cow disease)	United Kingdom
1996-1197	Microbiological contamination—berries	United States, Canada
1995-1997	Avian flu spreads to humans	Hong Kong, Taiwan (China)
1999	Dioxin in animal feed	Belgium
2000	Large-scale food poisoning (dairy)	Japan
2001	Contaminated olive oil	Spain
2002-2004	Isolated but repeated incidents of BSE	United States, Canada

Source: World Bank (2005).

over bioterrorism, and public concerns about the environment. The private sector has reacted to consumer concerns and official requirements by developing codes of practice and altering its product sourcing practices to emphasize limited sets of “preferred” or company-affiliated suppliers. While some efforts have been made to harmonize standards—at industry, regional, or international levels—the overall trend is toward a proliferation of standards and an increasingly complex commercial and regulatory environment. In this rapidly changing context, developing countries strive to keep up.

Impact of standards on trade in high-value agro-food products

While there is general agreement that food safety and agricultural health measures strongly affect international agro-food trade, there is no consensus on the relative importance of individual measures in relation to other trade-distorting measures, or on the aggregate net effect of those measures. The absence of consensus is not surprising, for testing the impact of such standards on trade presents enormous empirical difficulties. Consider these variables:

- What assumptions are made about how the broad array of measures is *actually enforced* and how enforcement deters or encourages potential export suppliers? Depending on the enforcement regime, the adjustments required of different suppliers may be significant or modest. This variable cannot be aggregated because it differs from country to country and among different industries.
- Food safety and agricultural health requirements may have many secondary and tertiary effects by provoking shifts in sourcing, affecting complementary and competitive goods, and inducing changes in the measures taken by other countries, to name just a few possibilities.

- Specific measures are frequently not a dominant determinant of observed trade flows. There is a risk in ascribing to agro-food standards shifts in trade that are driven by more fundamental economic or technical factors.
- Defining the counterfactual situation presents obvious problems. What would have happened in the absence of the measure? Would trade have continued unimpeded or might distributors and consumers have shifted to other suppliers? Might overall demand have declined for a product for which certain problems were identified?
- Many food safety and agricultural health measures will affect domestic suppliers as well, producing shifts in the relative competitiveness and market share of the different players.

Different methodologies have been used to estimate the impact of rising standards on developing country trade. Several studies based on gravity or other econometric models have tended to estimate very large losses in trade. In contrast, most industry case studies identify an array of competitive factors affecting trade (of which standards are one) and typically point to both winners and losers, rather than to an absolute decline in trade. For example, when Argentina encountered international market-access problems in the wake of outbreaks of food-and-mouth disease in its cattle herd in 2000 and 2001, the beef industry in Brazil stepped in with aggressive marketing and substantially increased its exports. When the Guatemalan raspberry industry faced official and private market-access problems in the late 1990s after an outbreak of food-borne illnesses in North America was attributed to its products, many leading operators shifted their production base across the border into Mexico. That country's raspberry exports have since blossomed. When U.S. beef is kept out of the Japanese market due to concerns about BSE, other countries expand their beef trade with Japan, and Japan increases its imports of nonbeef sources of protein.

Trade in high-value foods can be inhibited by interceptions of products at border points or by outright restrictions on trade due to the presence of certain animal diseases or plant pests or diseases in potential exporting countries. We consider these two possibilities in turn.

Some countries make available data on interceptions of food consignments for safety reasons, but the data do not include the volume or value of the products intercepted. Drawing on official data and consultations with private traders, Jaffee and Henson (2004) provide an order-of-magnitude estimate of the impact of rejections at the border: in 2000–01, some \$3.8 billion in world agro-food trade was affected, about 1 percent of all trade. Reflecting their dominant market share in certain product groups for which the incidence of border detentions is relatively high (for example, meat and dairy products; processed fruit and vegetables), high-income countries are estimated to account for 53 percent of rejected exports (and for some 63 percent of world agricultural and food product exports). The estimated value of developing

country agro-food border rejections is \$1.8 billion, three-fourths of which is accounted for by middle-income countries.²

The proportion of agro-food trade that encounters official rejections is, for most food categories, probably substantially lower than the proportion of sales subjected to price discounts by private buyers because of quality defects, lack of timeliness, and poor presentation. Further, only a small proportion of rejected consignments is actually destroyed at the point of import, while some (perhaps significant) proportion of the product is reshipped, reconditioned, or otherwise managed for sale in the domestic market of the exporter or some other international market. And the products with the highest estimated proportion of rejections are also among those that have seen the highest rates of growth in international agricultural trade.³

Based on these and other estimates, border rejections on grounds of food safety or related technical issues have probably had only a modest impact on overall trade in agricultural and food products, notably that of developing countries. But border rejections probably represent only a small part of the constraint on international trade in agricultural and food products associated with food safety and agricultural health measures. Far more inhibiting is the broad array of measures that render large numbers of countries ineligible to supply many livestock products and food crops to other countries. Meat and dairy products are subject to the highest level of rejections in global trade. Decades of traditional trade protections and trade-distorting subsidies in industrialized countries have kept these categories insignificant for low-income countries and probably of secondary importance for most middle-income countries. But animal disease controls act to exclude many developing countries from world markets for these products altogether.⁴ In part this reflects the prevalence of endemic infectious animal diseases in many low and middle-income countries. The costs of establishing and maintaining disease-free areas can be considerable and may be beyond the means of many of the poorest countries. But even where there is no evidence that such diseases are present, many developing countries lack the capacity for surveillance and risk assessment required to demonstrate that they do in fact have areas that are disease-free and to have those areas recognized as such by the World Organisation for Animal Health, known by its French acronym OIE (Office International des Epizooties).⁵

Even where developing countries have established disease-free areas, they face the risk that trade will be disrupted should outbreaks of disease occur. Restrictions applied to exports of poultry from Thailand and Vietnam after an outbreak of avian flu are just one example. In such cases exporters may be forced to divert products to domestic markets, causing a collapse of local prices. The overall impact of animal disease issues, therefore, is to enhance the risks associated with trade in livestock products, placing a great onus on public authorities not only to invest in

the establishment of disease controls, but also to ensure their continued efficacy over time.

Most low-income countries engaged in livestock trade have been unable to meet importers' food safety and agricultural health requirements pertaining to livestock disease and hygiene. Most are restricted to trade in live animals rather than livestock products, for which hygienic slaughter in an abattoir, meat inspection, and refrigerated transport must be provided.⁶ Examples of the export of live animals include intraregional trade in West Africa and supplies from East Africa to the countries of the Persian Gulf. However, even if their capacity in the area of animal disease and hygiene capacity could be enhanced, these countries would need to compete with well-established livestock product exporters—notably Argentina and Australia, reliable producers with fewer animal health problems and standardized production (Upton 2001).

Similar issues arise with plant pests and diseases, which arguably have the greatest impact on many developing countries, given the importance of trade in fresh fruit and vegetables, grains, and nuts. For example, many Caribbean countries face restrictions on the fresh fruits and vegetables that they can export to the United States because of the presence of various species of fruit fly. Jamaica, for example, is unable to export mangos to the United States because of the presence of West Indian and Caribbean fruit fly. In some cases exports are prohibited altogether, whereas in others prescribed treatments are required. These treatments can involve fumigation or use of hot water to kill pests. Such treatments impose costs on the exporter and reduce shelf-life and lower product quality. Further, the costs of establishing such facilities can be considerable. In some cases the impact of plant disease controls on trade in agricultural and food products can be mitigated through cooperation between governments, for example, through the sharing of plant pest surveillance data or the establishment of preclearance programs.

Rethinking the impact of stringent SPS standards—costs and benefits, winners and losers

The cost of complying with food safety and agricultural health standards has been a major source of concern in the international development community and among developing countries. Many worry that SPS standards will work increasingly to the disadvantage of developing countries that lack the administrative, technical, and other capacities to comply with new or more stringent requirements. However, the available evidence indicates that, in many instances, these challenges are manageable and the compliance costs a worthwhile investment, especially relative to the value of exports and associated benefits.

Developing country suppliers rarely face all-or-nothing choices when determining the changes and investments needed to conform to emerging standards. Only occasionally do SPS standards pose an absolute barrier to international market

Box 1: Discrimination in the Application of SPS Standards?

An Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) was annexed to the 1994 Marrakech Agreement that created the World Trade Organization. While the SPS Agreement sets out broad ground rules for the legitimate application of SPS measures, it has not eradicated the differential application of standards—and it is unrealistic to expect it to do so. Differentiation in the application of SPS measures is a necessary part of any risk-based food safety and agricultural health control system. At the country, industry, and enterprise levels, the hazards to be monitored and the control measures implemented must be prioritized to make the best use of limited resources. An effective risk management system will go further, to differentiate explicitly between alternative sources of supply based on differences in production conditions, past experience, and assessments of risk management capabilities in the supply chain. Many countries automatically detain imported products from countries with a history of noncompliance with food safety or agricultural health requirements.

In circumstances in which regulators and others have wide discretion and where various forms of differentiation are required for cost-effective management of food safety and agricultural health, there remains ample scope for anticompetitive mischief. Yet separating legitimate differentiation from illegitimate discrimination is problematic. It is even more difficult to prove that a given standard is wholly protectionist in intent. For example, in two widely cited cases where protectionism was assumed to have been an important motivating factor (involving restrictions on exports of Mexican avocados and Argentine citrus fruits to the United States), scientific justification was produced for the application of measures to prevent the spread of plant diseases, although less restrictive measures could have been applied (Roberts and Orden 1997). In other cases, trading partners have differing perspectives on the state of scientific knowledge or the need to make allowance for uncertainty. Perhaps the most prominent case is the dispute between the European Union (EU) and United States over restrictions on exports of beef produced with the use of hormones (Bureau and others 1998).

Among the many questions that remain about the use of food safety and agricultural health controls to discourage imports is whether foreign suppliers must comply with higher requirements than domestic suppliers. No systematic research has been done on this subject. On the basis of general impressions and anecdotes, it would appear that many countries, both industrialized and developing, do have a lower tolerance for certain animal and plant health risks in imports than in domestic products. Some countries have restricted supplies from countries where a plant pest or animal disease

Box 1. (continued)

occurs, even though the pest or disease in question is prevalent domestically. Similar observations can be made for some food safety controls. For example, the United States has long argued in trade forums that a broad array of countries have a near zero tolerance for salmonella in imported poultry products, yet this pathogen is widely present in their domestic supply chains. Other cases of discriminatory practices have been brought to the attention of the SPS Committee and addressed through bilateral or multilateral discussions (Josling and others 2004).

A second question relates to whether the enforcement of food safety and agricultural health measures is more stringent for imports than for domestic supplies. In discussions with high-value food exporters in developing countries one frequently hears the accusation that the controls they face are more rigorous than those imposed on domestic suppliers in certain industrialized countries. Frequently, however, this perception springs from the intensive oversight and monitoring performed by private entities, especially supermarkets and their buying agents, rather than from official systems of surveillance and product monitoring. In other cases, the methods of control they face are more visible than are domestic controls, in that compliance is assessed at the border, and on this basis entry can be denied. Domestic suppliers, by contrast, are regulated through inspection of their processing facilities, with a focus on system-based controls or market surveillance. Conversely, anecdotal evidence suggests that oversight for certain products and markets is more stringent on domestic rather than imported supplies. For example, over a typical three-year period the U.S. Food and Drug Administration (FDA) will undertake inspections of all the domestic firms that produce low-acid canned foods, yet the same inspections are conducted on just 3 percent of foreign facilities exporting such products to the United States. Even after substantially increasing resources for the inspection of food imports, the FDA still only inspects between 1 and 2 percent of the more than six million consignments of food and cosmetic products imported each year.

access—and then usually in relation to animal diseases and plant pests. Barriers created by food safety standards are usually relative—that is, they favor suppliers that can comply with the standards and tax those that cannot. Suppliers therefore need to weigh the costs and advantages associated with participating in different market segments. In some cases, they may have large and profitable opportunities to service the domestic market, the regional market, or market segments in industrialized countries that impose less stringent standards or allow more time to implement certain measures.

Even when targeting markets with relatively stringent standards, the level and relative significance of compliance costs varies greatly from industry to industry, between different countries, and among different firms and farms within the same industry. Several factors contribute to this variability:

- Typically there are several ways to meet a standard. Countries and firms that have chosen to be proactive—that is, to prepare in advance to meet anticipated standards—are better able to weigh and compare various options and to adopt those that are cost-effective. Entities that elect to delay compliance until after a crisis has occurred are likely to have less flexibility and may need to adopt costly measures simply to restore market access.
- Firms, industries, and countries operate from different starting points and with varying assets obtained from past investments. For a relatively modern and mature industry, a change in standards may require only incremental changes by producers or exporters and perhaps some modest adjustment in public sector oversight. However, for an underdeveloped supply chain, or where there is a lack of clarity on institutional roles, the new standard may require major investments in infrastructure and significant legal or organizational change.
- Market factors often affect the level and distribution of certain benefits. In some industries, price premiums are paid for products that can be labeled as “safe” or “sustainable,” or that bear other evidence of desirable attributes. In other industries, competitive pressures have made such attributes the minimal norm or driven down the value of such price premiums.

Many of the potential benefits of complying with stringent SPS standards and of improved SPS management by producers are long-term, intangible, or accrue to stakeholders that do not incur the associated costs (appendix 2). Benefits such as productivity gains, reduced wastage, worker safety, environmental benefits, and even the value of continued market access may be underestimated. This is unfortunate, because the perception that SPS compliance costs exceed the related benefits discourages needed investments and deters proactive approaches, thus increasing the likelihood of severe trade-related problems arising from adverse food safety or agricultural health events.

Many aspects of standards compliance do not require large investments or sophisticated technical or administrative capacities. The most significant challenge often is building broad awareness about the need for proper SPS measures and facilitating the broad adoption of good agricultural and manufacturing practices. A coherent regulatory framework and a system to assess compliance and conformity are also needed. Even in very poor countries, these systems and capacities can be developed if a proactive approach is adopted. Compared with the present and future volume of trade and other benefits, the costs of compliance usually are relatively low.

Although the overall trade of developing countries as a group has not been adversely affected by the tightening of SPS standards, the different approaches to this challenge and differences in underlying technical and administrative capacities have resulted in some relative winners and losers. Larger, incumbent suppliers tend to have an incremental advantage, because they can realize economies of scale, have better access to information, and benefit from well-established reputations (for example, with overseas inspectors). Small, poor countries and industries tend to be disadvantaged. Still, effective action can make a difference. There are examples of well-organized industries and well-managed firms and supply chains in low-income countries that have maintained or even enhanced their competitiveness and market share during this period of more stringent standards.

Although compliance (and noncompliance) can bring about changes that have a negative impact on the poor, those who are able to participate in evolving supply chains may benefit. This can certainly apply to small farmers operating in suitable locations with adequate infrastructure, including effective producer organizations and long-term relationships with buyers. Also, the tightening of standards has sometimes increased off-farm employment opportunities, especially in product cleaning, handling, processing, and packing, and in a broad array of process controls.

Presently, among low- and (to a lesser extent) middle-income countries, weaknesses in food safety and agricultural health management, both in the private and public sectors, constrain productivity and competitiveness. Such constraints almost certainly will take on greater importance in the coming years, given trends in consumer attitudes and preferences, changes in supply-chain governance and market structures, and continued advances in science and technology. Interventions to strengthen SPS management capacities can contribute to growth and poverty reduction by removing those constraints.

Using one's room for maneuver—toward a proactive approach to SPS management

As the demand for high-value food products grows rapidly over the coming decades, countries and individual producers that approach standards compliance as part of an overall competitive strategy are likely to thrive. Certain developing country industries—Kenya's horticulture sector, for example (box 2)—have succeeded in meeting standards by adopting a proactive approach to compliance—staying abreast of shifting technical and commercial requirements in their chosen markets and anticipating future changes. These firms have pursued and used higher standards to reposition themselves in remunerative market segments, sometimes by adding value to commodities.

More generally, a forward-looking approach requires certain national and industry capacities, including those for channeling information and interpreting international regulatory and commercial trends, conducting risk analysis, undertaking

hazard surveillance and monitoring, and applying contingency planning in SPS management (appendix 3). A successful proactive campaign also requires that policymakers, firms, and industry organizations adopt the perspective that effective SPS management is a core element of overall competitiveness. Failure to address

Box 2. Kenyan horticulture: high costs and high gains at the top of the market

Kenya's experience with fresh vegetable exports demonstrates that a well-organized industry in a low-income country can use standards for competitive gain. The leading firms in Kenya's fresh produce industry chose in the early 1990s to "ride the tail" of British supermarkets, investing in products, internal systems, and supply chains to service the premium-quality end of the market, including the growing demand for salads and other semi-prepared vegetable products. These firms and their farmer suppliers bore most of the costs of compliance—and reaped most of the benefits.

The costs of the tail-riding strategy have included the construction of high-care processing facilities, investment in private laboratories, and the development of full supply-chain traceability. Leading companies have upgraded and expanded their facilities, installing new lighting and water sanitation systems, advanced cold treatment and storage systems, facilities for worker hygiene and quality management (such as hazard analysis and critical control point systems).

Yet the benefits from these investments and of general compliance with the requirements of upscale supermarkets also seem to have been significant. The net profit margins of large Kenyan exporters can be as high as 14 percent for "high-care" packaged goods, compared to 2 percent for bulk vegetables packed loose in cartons. Other benefits perceived by the exporters include regularity of demand, advance information from supermarket clients on market trends, certainty with respect to quality and hygiene specifications, and enhanced reputation.

The payoff on Kenya's proactive investment has been great. Over the past decade, as EU imports from nonmember countries were flat, Kenya was able to increase the value of its fresh vegetable exports significantly, in large part by shifting the product composition of its trade, meeting the highest standards in EU markets, and achieving an upward shift in the unit value of its exports. From 1991 to 2003, the value and volume of Kenya's exports of fresh vegetables increased five fold.

SPS problems or concerns may undermine an industry's access to remunerative international markets. But where fundamental supply-side problems persist, the resolution of SPS constraints will not yield sustained export success.

The foregoing observations imply that many developing countries can profit by viewing strict standards as a stimulus for investments in supply-chain modernization, providing incentives for the adoption of better safety and quality control practices in agriculture and food manufacturing, and clarifying the appropriate and necessary roles of government in food safety and agricultural health management. Rather than degrading the comparative advantage of developing countries, the compliance process can result in new forms of competitive advantage and contribute to more sustainable and profitable trade over the long term.

Moving ahead: a capacity-building agenda for developing countries

Improved SPS capacity is the key to a successful proactive approach to compliance. The proactive approach to standards compliance is most likely to succeed when supported by adequate capacity in food safety and agricultural health control, and when policymakers have the confidence to voice their concerns about the standards imposed by trading partners and buyers. Every new SPS standard, public or private, favors those market players that are able to anticipate it. Private producers must have the capacity to target the right markets and to be ready to comply or make other adjustments before standards are imposed and trade is disrupted. Policymakers must draft sensible regulations; regulators must have the capacity to enforce those measures. Standards can represent both an opportunity and a catalyst, but for those poorly prepared or disinclined to take active steps, they will almost certainly prove a barrier to trade. To make further progress in this domain:

- Rich countries and pertinent technical agencies should increase and reorient their assistance to developing countries for SPS capacity building, providing it before crises occur. Many past interventions have been triggered by emergency situations, such as trade disruptions or disputes, rather than by the prospect of forging a strategic approach to SPS management and investment. Future capacity-building efforts should be geared toward maximizing the strategic options available to both government and the private sector in developing countries faced with new or more stringent SPS standards.
- Industrial country governments should harmonize SPS product and process requirements with those of other countries (and with established international norms), where there is an identified benefit of doing so. Through memoranda of understanding, twinning arrangements, and other programs, they should work closely with developing country trading partners to achieve mutual recognition of SPS management systems and to ensure that the impact on developing countries of proposed SPS measures is understood in advance.
- To reduce costs and ensure sources of supply, the private sector in industrial

countries should harmonize or mutually benchmark the growing array of overlapping and competing private protocols on good agricultural and manufacturing practices, and other process standards. It should consult developing country suppliers when developing or revising standards so as to make their implementation more user-friendly and cost-effective. Supply chain leaders should consider joining with governments and donor agencies to provide technical assistance to suppliers to enable them to meet emerging requirements.

- Developing country governments should move beyond control functions to build awareness about SPS management and to facilitate individual and collective action by private companies, farmers, and others. Adopting a long-term, strategic approach to managing SPS standards and international market access obliges policymakers and technical administrators to work closely with the private sector to identify emerging challenges and opportunities, make appropriate regulatory changes, and choose suitable strategies and needed investments. Clear distinctions should be made between food safety and agricultural health challenges. Many of the former can be addressed by individual company actions, whereas many of the latter require systemic approaches or controls that extend beyond the sphere of individual firms or supply chains.
- The private sector in developing countries should incorporate current and expected requirements related to SPS and other standards into business plans, including considerations of product-market combinations, customer and supply relationships, production technology, logistics, and investments in processing and marketing facilities. It should work through industry organizations to advocate for effective public sector support and to implement programs to build awareness, encourage adoption of good practices and codes of practice, and otherwise strengthen food quality and SPS management within their industries.

Appendix 1. The World Bank's research program on sanitary and phytosanitary (SPS) measures

The World Bank's research program on sanitary and phytosanitary (SPS) measures was designed to improve understanding of an emerging set of policy and commercial issues in the area of food safety and agricultural health. It does not cover other standards, such as labor, environmental or animal welfare requirements. The program has involved a series of case studies covering selected commodity supply chains in nine low- and middle-income countries—Ethiopia, India, Jamaica, Kenya, Morocco, Nicaragua, Senegal, Thailand, and the countries of Latin America's Southern Cone. The commodity chains are those related to fish, horticulture, livestock products, nuts, and spices. They were chosen because the products involved have posed SPS compliance challenges for a significant number of developing countries and have been the subject of many recent food safety events or crises in industrialized countries. Countries were selected to capture regional diversity, varied market orientations, and a range of experiences, from emerging to long-standing industries. Complementary "buyer studies" were also carried out, involving representative importers and retailers of shrimp and selected fruits and vegetables in the European Union, Japan, and the United States.

The major themes and questions addressed in the research program have been:

- *Overall context and prominence.* How difficult are the challenges posed by rising private and public SPS standards for developing country suppliers? What is the relative significance of these challenges, compared with other factors affecting competitiveness?
 - *Dynamics and differences in standards.* What are the similarities and distinctive features of the evolving standards for different product groups and in relation to different industrial country destination markets? What are the main driving forces behind the newer standards? What can be expected in the future?
 - *Strategies to comply with or influence standards.* What strategies have been used and have worked to meet the emerging requirements or influence their application? What are some key factors influencing the viability and sustainability of different approaches?
 - *Costs and benefits of compliance.* What is the nature, magnitude, and overall significance of costs and benefits associated with supplier (and country) compliance with external market standards?
 - *Structural and distributional implications.* What are the implications of standards-related barriers and compliance for market structures and for the participation of small-scale farmers and firms in export-oriented supply chains?
 - *Lessons from donor-supported programs.* What have been the patterns of capacity-building assistance in this field in recent years? What lessons can be drawn about the timing, institutional features, effectiveness, and sustainability of capacity-building programs?
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Table A1. Country and commodity case studies in the World Bank's research program

Fish, shrimp, and fish products	India, Jamaica, Kenya, Nicaragua, Senegal, Thailand
Fruits and vegetables	Jamaica, Kenya, Morocco, Thailand
Animals/animal products	Ethiopia (live animals), Latin America's Southern Cone (beef and Foot-and-mouth Disease (FMD) control)
Nuts and spices	India (spices), Senegal (groundnuts)

Source: World Bank (2005).

Table A2. Costs and benefits of complying with SPS standards

Costs—Investment: 0.5–5 percent of the multiyear value of trade; Recurrent: 1–3 percent of annual sales	Benefits—Often hard to compute
<ul style="list-style-type: none"> • Upgrade of laboratory infrastructure • Upgrade of processing facilities • Investments in farm-level facilities to comply with GAP requirements • Reduced investment in new product development • Reduced investment in domestic food safety controls • Collection and analysis of laboratory tests • Additional costs for 'certified' raw materials • Additional costs for implementing hazard analysis and critical control point system • Reduced flexibility in production processes • Reduced domestic food safety enforcement 	<ul style="list-style-type: none"> • Crisis containment, as when traceability system prevents an alert from becoming a crisis • Increased attention to overall efficacy of controls • Access to more remunerative markets and supply chains • Greater efficiency, thus lower costs • Less waste in production processes • Reduced incidence of product inspection and detention abroad • Enhancement of product quality • Higher morale of inspection and production staffs • Improved reputation of firm and/or country • Improved worker safety and reduced environmental degradation

Source: World Bank (2005).

Table A3. Common food safety and agricultural health management deficiencies in selected sectors

Fish products	Horticultural products	Animal health
<ul style="list-style-type: none"> ▪ Inadequate legislation relating to hygiene controls in fish processing 	<ul style="list-style-type: none"> ▪ Weak regulatory systems relating to the import, production, and sale of pesticides. 	<ul style="list-style-type: none"> ▪ Weak systems to monitor emerging regulatory changes related to animal disease controls on imports in existing or potential export markets
<ul style="list-style-type: none"> ▪ Poorly defined administrative responsibilities for approval and inspection of processing facilities and certification of exports 	<ul style="list-style-type: none"> ▪ Lack of capacity to undertake pest-risk analyses 	<ul style="list-style-type: none"> ▪ Inadequate legislation and undocumented procedures relating to animal health controls
<ul style="list-style-type: none"> ▪ Weak inspection systems for processing facilities, including lack of documented procedures, insufficient inspection staff, limited skills and weak reporting 	<ul style="list-style-type: none"> ▪ Weak controls relating to plant pests and diseases at borders 	<ul style="list-style-type: none"> ▪ Weak controls relating to animal diseases at borders
<ul style="list-style-type: none"> ▪ Weak laboratory testing capacity for microbiological and chemical contaminants and for residues of antibiotics 	<ul style="list-style-type: none"> ▪ Low capacity to implement quarantine measures and enforce pest-free areas 	<ul style="list-style-type: none"> ▪ Weak capacity to implement quarantine or control/eradication measures in the event of a disease outbreak
<ul style="list-style-type: none"> ▪ HACCP systems not widely implemented in fish-processing plants and not extending to fishery capture and production 	<ul style="list-style-type: none"> ▪ Limited farmer knowledge of alternative pest-management approaches and appropriate use of pesticides 	<ul style="list-style-type: none"> ▪ Weak capacity to undertake disease surveillance and risk assessments
	<ul style="list-style-type: none"> ▪ Limited application of HACCP principles by fresh vegetable packers/exporters (especially SMEs) 	<ul style="list-style-type: none"> ▪ Weak laboratory testing capacity related to the diagnosis of animal diseases and monitoring programs
	<ul style="list-style-type: none"> ▪ Limited systems for fresh-produce traceability 	<ul style="list-style-type: none"> ▪ No incentive to divulge or publicize outbreaks of animal diseases

HACCP = Hazard analysis and critical control point
 Source: World Bank (2005).

Notes

1 This note is based primarily on the report “Food Safety and Agricultural Health Standards: Challenges and Opportunities for Developing Country Exports” (Washington, DC: World Bank, 2005), <http://www.worldbank.org/trade/standards>.

2 Jaffee and Henson (2004) estimate the value of agro-food exports from low-income countries rejected at the border of importing countries at \$275 million, slightly less than 1 percent of the agro-food exports of those countries. Fish and fishery products probably account for more than one-half of this affected trade.

3 Although the overall impact of border rejections on trade may not be very significant, the costs may be considerable for individual suppliers (or countries), both in terms of the value of lost products and adverse effects on the supplier’s reputation.

4 For example, the United States currently permits imports of beef from only 33 countries and imports of chicken from only four countries.

5 Currently, the OIE recognizes only 57 countries as being totally free of foot-and-mouth disease without vaccination, of which 26 are developing countries and only 3 are low-income countries.

6 Indeed, widespread cases of both new and well-established animal diseases have led to heightened concerns about the role of international trade in the spread of such diseases. In the case of BSE, widespread restrictions have been applied to trade in live animals, meat, animal feed, and an array of by-products used in cosmetics, pharmaceuticals, and other industries.

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