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Food Safety and Agricultural Health Standards

Challenges and Opportunities for Developing Country Exports

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Poverty Reduction and Economic Management Trade Unit, and
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ACRONYMS

ACWL	Advisory Center on WTO Law
APEC	Asia Pacific Economic Cooperation
APHIS	Animal and Plant Health Inspection Service
BRC	British Retail Consortium
CAC	CODEX Alimentarius Commission
CBPP	Contagious Bovine Pleuro-Pneumonia
CDC	Centers for Disease Control and Prevention
COLEACP	Liaison Committee Europe, Africa, Caribbean, Pacific
DSB	Dispute Settlement Body
EUREPGAP	Euro-Retailer Produce GAP
FAO	Food and Agriculture Organization
FDA	Food and Drug Administration
FMD	Foot and Mouth Disease
FVO	Food and Veterinary Office
GAP	Good Agricultural Practices
GMO	Genetically Modified Organisms
GMP	Good Manufacturing Practices
HACCP	Hazard Analysis and Critical Control Point
ICPM	Interim Commission on Phytosanitary Measures
IPPC	International Plant Protection Convention
JMPR	Joint Meeting on Pesticide Residues
MPEDA	Marine Products Export Development Authority
MRL	Maximum Residue Limit
NGO	Non-governmental Organization
OECD	Organization for Economic Co-operation and Development
OIE	Office International des Epizooties
PIP	Pesticides Initiatives Program
PIPAA	Integrated Program for Agricultural and Environmental Protection
PROMPEX	Peruvian Commission for Export Promotion
RVF	Rift Valley Fever
SAM	Social Accounting Matrix
SEAI	Seafood Exporters Association of India
SPS	Sanitary and Phytosanitary
STDF	Standards and Trade Development Facility
UNIDO	United Nations Industrial Development Organization
USAID	United States Agency for International Development
USDA	United States Department of Agriculture
WHO	World Health Organization
WTO	World Trade Organization

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EXECUTIVE SUMMARY

Background

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. Fresh and processed fruits and vegetables, fish, meat, nuts, and spices now collectively account for more than 50 percent of the total agri-food exports of developing countries. Their share of developing country trade continues to rise while that of traditional commodities—such as coffee, tea, cocoa, sugar, cotton, and tobacco—declines. Patterns of consumer demand and commercial development in both industrial and middle-income countries will reinforce this trend and continue to provide outstanding opportunities for competitive suppliers of high-value foods.

Besides demand-related factors, two important developments will affect the magnitude of the opportunities, as well as the rules of the game, facing developing country suppliers. One is the outcome of the current Doha round of multilateral trade negotiations, during which changes are likely to be made in traditional forms of trade protection and agricultural production support. Reductions in such distortions are likely to have far less impact on the level and direction of trade in high-value foods than for certain traditional commodities. The second contextual force is already well-advanced and will continue regardless of the outcomes of the Doha round. It is the proliferation and strengthening of food safety and agricultural health standards, a process occurring at the national and international levels, as well as in individual supply chains.

Although food safety and agricultural health standards are designed to manage risks associated with the spread of plant and animal pests and diseases and the incidence of microbial pathogens or contaminants in food, standards also can be used as a trade protection measure. There is growing concern within the international development community that standards will undermine the competitive progress already made by some developing countries and present insurmountable barriers to new entrants into the high-value food trade. There is particular concern that:

- Emerging food safety and agricultural health measures will be applied in a discriminatory manner;
- Developing countries lack the administrative, technical, and other capacities to comply with new or more stringent requirements;
- The costs incurred to reach compliance will undermine the comparative advantage of developing countries in the high-value food trade;
- Institutional weaknesses and compliance costs will further marginalize weaker economic players, including smaller countries, enterprises, and farmers; and
- Inadequate support is available for capacity-building in this area, despite the provisions made in the WTO Agreement on the Application of Sanitary and Phytosanitary Measures.

Scope

The World Bank's research program on sanitary and phytosanitary (SPS) measures, the results of which are summarized in this report, was designed to improve understanding of an emerging set of policy and commercial issues in the area of food safety and agricultural health.¹ The program's objective is to inform policymakers, private sector representatives, development practitioners, and trade and agricultural policy researchers, and to define the scope and approach for World Bank operational activity to meet growing client demand in this area. The major themes and questions addressed in this 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 have been workable combinations of individual and collective action and public and private sector action? What are some key factors influencing the viability and sustainability of different approaches?
- *Costs and Benefits of Compliance.* What are 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?
- *Operational Implications for the World Bank.* What principles should guide future Bank operational work in this field? What roles can the Bank play in this field, given its mandate, relative institutional strengths and weaknesses, and the prevailing challenges for clients?

¹ This research did not cover other standards, such as labor, environmental, or animal welfare requirements.

Methods

The research program has involved a series of case studies covering selected commodity supply chains in nine low- and middle-income countries.² 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 “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 United States, European Union, and Japan. This fieldwork was supplemented by a desk review of selected development agency experiences in supporting capacity-building in SPS management, and by a broader review of literature and data pertinent to developing country experiences in this field.

Main Findings

Context and Prominence of Food Safety and Agricultural Health Standards

Food safety and agricultural health risk management should be considered as a core competence in the competitiveness of developing countries, especially in the context of trade in high-value food products. Effective capacities in SPS management are taking on increased importance among the wider set of competitiveness factors, such as stable macroeconomic conditions, suitable climatic conditions, effective logistics, and trade facilitation systems.

SPS-related challenges should be addressed within the broader context of competitiveness rather than through isolated interventions. Addressing SPS-related challenges, although important, will not improve competitiveness where other major weaknesses persist. Rather than representing a unique set of circumstances, standards-related challenges (and opportunities) usually accentuate underlying competitive and capacity strengths and weaknesses in an industry or country. The picture that emerges from the study shows that where an industry has already made substantial progress in relation to quality control, logistics management, and so on, the capacity to meet emerging SPS requirements is also normally adequate. Where other fundamental competitiveness problems persist, related weaknesses (administrative, financial, or other) typically impede the resolution of SPS constraints.

SPS measures may pose an absolute barrier to trade with some countries, where certain plant pests and animal diseases require very stringent controls or eradication measures. Such absolute barriers are comparatively less common in relation to food safety measures, although the cost of meeting specified requirements may be high for certain suppliers. In either case, however, *developing country suppliers rarely face all-or-*

² Ethiopia, India, Jamaica, Kenya, Morocco, Nicaragua, Senegal, Thailand, and the countries of Latin America’s Southern Cone.

nothing choices when determining the changes and investments needed to conform to emerging standards. Suppliers need to weigh the costs and advantages associated with participating in different market segments—standards are one factor in the calculus. In some cases, there may be 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.

Although new or more stringent standards can serve as a trade barrier, they act more often as a catalyst for progressive change. Stricter standards can provide a stimulus for investments in supply-chain modernization, provide increased incentives for the adoption of better safety and quality control practices in agriculture and food manufacturing, and help clarify 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, as shown by the case studies of Thai and Kenyan horticulture, Thai and Nicaraguan shrimp, and Indian spices.

Evolving Industrialized Country Standards for High-Value Foods

Consumers in industrialized countries have long had concerns about certain dimensions of food safety, especially the presence of chemical residues and various contaminants in food. However, over the past two decades, consumers have been exposed to a continuous series of food safety “scares”, including major outbreaks of food-borne illness, new scientific links between animal and human diseases, and discoveries of tainted food and feed supplies. These developments and concerns accumulated, with each new event eroding consumer confidence in the safety and integrity of their food and the trustworthiness of national and regional systems of regulation, as well as the science supporting those systems.

Governments and the private sector have responded to these developments in various ways. Their responses have yielded a new paradigm in food safety regulation and management. At the official level, regulations have been revised and significant institutional changes have been made in food safety oversight. Standards have been tightened on foods that have long raised concerns, while new standards have been developed for previously unknown or unregulated hazards. *Governments are increasingly adopting a production-to-consumption (or farm-to-table) perspective, requiring traceability of animals, products, and raw materials, while national systems for border inspections of food and plants have been scaled up.*

Spurred by these regulatory changes and the business cost of food scares, supply-chain leaders such as food retailers and major food manufacturers have led the private sector in making adjustments to food safety and quality management systems and demanding similar changes on the part of suppliers. In addition to laying down and enforcing their own safety and quality requirements, the leaders are increasingly consolidating their systems of procurement, entering into longer term relationships with a more limited

number of “preferred suppliers.” Many different schemes are being promoted or imposed at the level of individual companies, specific supply chains, national industries, regional groupings of firms, and even, internationally.

Several observations can be made about the evolving set of standards which are affecting trade in high-value foods:

- While much of the general ‘standards as barrier’ concern has centered on official regulations, in relation to food safety it is commonly the case that private standards and protocols are comparatively more stringent and/or more effectively enforced. Official regulations continue to exercise much stronger influence over market access in relation to plant and animal health matters;
- While institutional and regulatory trends in different industrialized countries are moving in broadly similar directions and while there are on-going efforts to harmonize standards, there remains great diversity in the operative ‘rules of the game’. There are some circumstances of protectionist use of standards, yet most of the diversity in standards stems from other factors. Regulatory systems entail a mix of old and new requirements, and reflect different perceptions of risk, scientific traditions and climatic/geographical considerations;
- Differential application of standards is the norm rather than the exception. Indeed, at country, industry, and enterprise levels, there is a need to prioritize the hazards to be monitored and the control measures to be applied. As resources are scarce, it is necessary to differentiate between alternative sources of supply based on past experience, assessments/perceptions of capacities, etc. Separating legitimate differentiation (i.e. risk management) from non-legitimate differentiation (i.e. discrimination) is problematic and is the source of various disputes;
- Increasingly, industrialized countries (and certain supply chains, in particular) are moving to a situation whereby potential international suppliers of live animals, plants and certain food products need to be pre-approved based upon their pest and disease status or the audited hygienic conditions in their food export establishments. This trend will continue; and
- The complexity of the standards setting for high-value foods is likely to increase in the future given the emerging tendency, especially within the private sector, to package together safety, quality, environmental, and social standards.

This evolving set of standards has important implications for developing countries. First, relevant stakeholders face a major challenge in simply being aware of the rules and requirements pertinent to particular markets and understanding how the game is actually played. This learning curve gives incumbent countries and suppliers a large advantage over new entrants. Second, it is more urgent than ever before that developing country stakeholders participate in standard-setting processes, whether through international organizations, bilateral discussions, or membership in private bodies. Third, there is an

acute need for a strategic approach to capacity-building related to standards. That approach would gauge the direction of future standards, act in a preemptive fashion to address emerging risks, and, where possible, get ahead of the curve by asserting competitive advantage through effective application of standards. Fourth, although the diversity of existing standards may sometimes increase transaction costs, it also may enable developing country suppliers to choose among markets for whose standards they can most readily meet. Given the diversity of standards applied within and between countries, there is scope for different speeds on the highway of standards compliance. This is certainly the case when one considers the emerging opportunities for South-South trade in high-value food products.

Strategic Options and Approaches

Government and the private sector in developing countries should adopt a strategic approach to food safety, agricultural health, and trade, one that takes into account broad commercial and developmental objectives. Among the factors that must be considered are the long-term costs and benefits of compliance, and, for policymakers, the wider distributional and societal impacts of the available responses. Strategic approaches can be crafted by individual private entities or public agencies, or through various types of collective action. Once adopted, they are likely to require amendment in response to further changes in external standards and the broader trade environment.

The report identifies and illustrates three types of strategies available to developing countries in the face of evolving food safety and agricultural health standards. They are:

- *Exit*, which implies switching away from certain markets, products, or buyers toward others whose standards may be more cost-effectively met. (Going out of business altogether is another form of exit.)
- *Voice*, whereby developing country governments and exporters seek to influence the standards that they face through negotiations (with technical agencies in the countries of trading partners, for example, or with a major buyer) or through formal complaints (via international venues such as the WTO's SPS Committee).
- *Compliance*, whereby a set of legal, administrative, technical, and organizational steps is taken to conform with product or process requirements.

In the case study industries covered in this study, each of these strategies has been applied to some degree, although the relative emphasis has varied. Given alternative market opportunities in the high-value food business, various forms of exit may indeed be the most appropriate commercial strategy. In many if not most circumstances, the strategic choice is not 'comply or else'. Exercising effective voice is usually quite difficult for smaller countries and individual suppliers, although opportunities often arise for dialogue about how particular standards are to be applied. The report provides some evidence of larger developing countries (Argentina and India, for example) influencing the rules of the game through their voice.

Compliance strategies receive the most attention in the report. Some of those strategies are driven by the private sector; others involve more significant roles by governments in managing food safety and agricultural health risks. Several of the industries covered in the report have succeeded in meeting standards by adopting a *proactive* stance—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 more remunerative market segments, sometimes by adding value to commodities.

In other cases, the private sector and government have only *reacted* to regulatory change or acted only after trade interruptions—owing to food safety or agricultural health problems--occurred. The quality and effectiveness of these responses have varied, both among countries and among different firms in the same industry. Many firms and farms proved unable to make the necessary adjustments. More often than not, there were other extenuating circumstances, including resource management problems and broader competitive pressures that exacerbated the challenge posed by rising standards.

The analysis of particular commodity chains brought out some common constraints and capacity weaknesses. For example, among the horticultural industries common weaknesses related to the regulatory systems governing the import, production, sale, and use of pesticides, and the capacities to implement quarantine measures and undertake pest risk analysis were found. Among the fish product industries, common problems included lack of clarity about administrative responsibilities for inspection and certification of facilities and products, and the persistence of unhygienic conditions at some fish landing sites and processing facilities. In the meat sector, weak surveillance systems were one of the most common weaknesses.

The objective of capacity-building in the food standards field needs to be recast away from coping strategies and technocratic problem-solving, and beyond a pure public sector focus. Future capacity-building efforts should be geared toward maximizing the strategic options available to both government and the private sector in developing countries when faced with new or more stringent standards. The proactive approach to standards compliance is most likely to succeed when underpinned with the necessary capacity in food safety and agricultural health control, and when policymakers have the confidence to speak out when they are concerned about the standards imposed by their trading partners and buyers.

Effective pro-activity 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. It also requires that policymakers, firms, and industry organizations adopt the perspective that effective SPS management is a core element of overall competitiveness strategies.

Costs and Benefits of Compliance with Standards

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 commentators see standards as an absolute barrier to trade for poorer developing countries because the cost of meeting them are assumed to be prohibitively high. *However, the available evidence indicates that, in many instances, the costs are less than assumed, especially relative to the value of exports.*

Few generalizations can be made about the costs and benefits of compliance. 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 a proactive stance in the evolving standards environment are better able to weigh and compare various options and to adopt those that are more cost-effective. Entities operating in a reactive mode or delaying 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 are operating from different starting points and with varying assets obtained from past investments. For a relatively modern and mature industry, a change in standards may necessitate 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 necessitate major investments in infrastructure and significant legal or organizational change.
- Costs and benefits are also affected by industry structure, geography, and the effectiveness of collective action—whether in the private sector or through joint public-private entities. There are economies of scale and scope associated with various SPS management functions, such as animal-disease control, and the realization of those economies is affected by the above factors, among others.
- Market factors often affect the level and distribution of certain benefits. In some industries, price premiums are paid for products labeled as “safe” or “sustainable,” or bearing 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.

Costs are often more readily apparent than benefits. Many potential benefits of standards compliance are long-term, intangible, or accrue to stakeholders who do not incur the associated costs. The widespread, but often mistaken, 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.

Distributional Impacts

The costs and structural changes associated with compliance with food safety and agricultural health standards can cause significant redistribution of welfare across countries, along supply chains, and in societies. These distributional effects can come through direct changes in product, labor, and land markets or through various secondary effects (in public health, for example, or in local environmental conditions). While the available evidence on this issue in developing countries remains fragmentary, several tentative conclusions can be drawn from the current research and complementary analyses. For example:

- Developing countries as a group are not suffering from the tightening of SPS standards. Yet, differential approaches to the challenge of compliance, and technical and administrative difficulties in ensuring compliance, are affecting the relative competitiveness of some countries in high-value food markets. 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). 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 (such as Kenya) 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. A key challenge is to reduce, through various types of collective action, the transaction costs associated with monitoring and certifying farmers' compliance.
- The tightening of standards appears to be giving rise to increased off-farm employment opportunities, especially in product cleaning, handling, processing, and packing, and in a broad array of process controls. The terms and conditions of this employment in the formal supply chains, although not optimal, are almost certainly better than in the informal sector, in part because many foreign buyers are imposing labor standards.

Trade-Related SPS Capacity Building

In response to specific trade interruptions and more general concerns about problems in meeting external market standards, developing countries have sought technical assistance and other capacity-building support from various development agencies and bilateral

donors. This report presents the summary findings of a desk review of recent and ongoing capacity-building programs. Some of the major findings are as follows:

- *Most interventions in the SPS field have been driven by tension or emergency*, such as trade disruptions or disputes, or a threat of such an event. The sense of urgency that has dominated donor interventions has profoundly affected project design and implementation. Much support has been geared toward damage control and restoration of past trade, rather than toward forging a strategic approach to SPS management and investment.
- As a result, *most interventions have involved little economic analysis*—whether *ex ante* considerations of the potential costs and benefits associated with alternative approaches or *ex post* reviews of the impact and cost-effectiveness of the adopted measures. *Sustainability of project outcomes has often been neglected*—with the primary measure of project success being whether the recipient country has overcome a trade-related crisis in the short run.
- Many technical assistance projects in this field have directed their attention to public sector agencies or private entities—but not both. This pattern of attention stems from the specific mandates of specific agencies, the particular requirements of certain trading partners, or the need to be pragmatic in order to get quick results in the face of a trade disruption. Yet both the public and private sectors have fundamentally important roles in food safety and agricultural health management. At a minimum, their responses should be coordinated; ideally they should be integrated into a concerted effort to address emerging standards.

Conclusions and Recommendations

Interventions to strengthen SPS management capacities can contribute to growth, poverty reduction, and the pursuit of national and international public goods. 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 will almost certainly take on greater importance in the coming years, given trends in consumer attitudes and preferences, changes in supply-chain governance and market structures, the changing composition of international food and agricultural trade, and continued advances in science and technology. This combination of factors provides a powerful rationale for the World Bank and other development agencies to increase their support efforts in this area.

The research and a broad interpretation of its results lead to the following recommendations for various entities and decision makers:

Policymakers and Technical Administrators in Developing Countries

- *Adopt a forward-looking and strategic approach to managing SPS standards and international market access.* This means working closely with the private sector

to identify emerging challenges and opportunities, choose suitable strategies and needed investments, and make appropriate regulatory changes. The expected costs and benefits of the alternative and the selected strategies must be carefully considered.

- *Make clear distinctions between the challenges associated with agricultural health versus those for food safety.* In a trading context, agricultural health problems may result in absolute loss of market access, while this is rarely the case with food safety. Addressing trade-related agricultural health problems may necessitate systemic approaches, controls, and risk analyses that extend beyond the sphere of individual firms or supply chains.
- *Move beyond control and policing to emphasize building awareness of quality assurance and SPS management.* Most of the day-to-day measures to achieve compliance must be undertaken by commercial entities and farmers. Therefore, collective action by firms and primary producers should be encouraged and facilitated. In countries with limited public administrative capacities (or strong private sector capacities), certain tasks may be delegated to the private sector, with public oversight.
- Recognizing the complexity of SPS management and the potential for SPS-related barriers to regional trade, *collaborate with neighboring and other regional countries to share or specialize in certain SPS management functions.* Examples include standard setting, accreditation, certification, and testing.

The Private Sector in Developing Countries

- *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.
- *Work through industry/trade 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 the private sector.

Industrial Country Governments

- Include in SPS regulatory assessments the prospective impacts of the proposed measures on the market access and competitiveness of developing countries and consider measures, including technical assistance, to mitigate potential adverse effects.
- Be aware of the impacts of private standards on exports of agricultural and food products from developing countries and work with the private sector to find ways to facilitate compliance, for example, through technical assistance.
- Harmonize SPS product and process requirements with those of other countries, including through the establishment of international standards, where there is an identified benefit of doing so.

- Through memoranda of understanding, twinning arrangements, or other programs, work closely with developing country trading partners to achieve mutual recognition of SPS management systems. Also, increase efforts to inform policymakers, technical counterparts, and private industry representatives in developing countries about regulatory changes that may affect their exports.

The Private Sector in Industrial Countries

- Move to harmonize or mutually benchmark the growing array of overlapping and competing private protocols on good agricultural and manufacturing practices, hazard analysis and critical control point (HACCP) systems, and other process standards. Doing so would save own and supplier costs while enlarging and diversifying the base of potential supplier countries.
- Increase consultations with developing country suppliers when developing or revising standards. Make their implementation and certification more user-friendly and cost-effective.
- Intensify efforts to convey information to developing country suppliers about evolving consumer preferences and developments in regulatory and private standards.
- Enter into joint programs with governments and donor agencies to provide technical assistance to suppliers to enable them to meet emerging requirements.

Bilateral and Multilateral Development Agencies

- Increase technical assistance and other capacity-building support to developing countries for SPS management.
- Improve the quality and sustainability of this support by promoting the adoption of proactive and strategic approaches, undertaking cost-benefit analyses, balancing support for public and private sector capacity-building, and balancing attention to very basic and decentralized functions (such as good agricultural practices and HACCP systems) with more technically demanding SPS capacity needs.
- Consider the distributional impact of SPS measures and compliance, with particular attention to smaller and poorer countries. Develop and promote cost-effective approaches to certifying and tracing products from smallholder farmers and small and medium-sized enterprises.
- Pay greater attention to the standards-related challenges and opportunities of South-South trade. Increase efforts to support regional initiatives to harmonize standards, address common (and cross-border) agricultural health hazards, and build complementary SPS management capacities.

The World Bank

In addition to the above recommendations for development agencies, the World Bank should:

- Conduct further economic and policy analysis on the trade challenges and opportunities facing developing countries in relation to food safety and agricultural health. Continue to advocate for the interests of developing countries—and for the poor in those countries—in this field.
- Advocate for the refocusing of capacity-building efforts toward a strategic perspective. Urge developing countries to be more active in defining and addressing their SPS management needs.
- Mainstream policy advice and investment lending pertaining to SPS management and market access within the Bank’s wider operational program, especially in relation to the promotion of agricultural competitiveness, smallholder commercialization, and trade and regional integration.
- Complement and integrate efforts in this field by technical agencies (Food and Agriculture Organization, World Health Organization, World Organization for Animal Health, United Nations Industrial Development Organization, International Standards Organization) and bilateral donors, and closely cooperate with these agencies to pursue common mandates and to apply complementary expertise and resources. The recently established Standards and Trade Development Facility offers a platform for such integration.

CHAPTER 1

INTRODUCTION

1.1 Setting

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 and methods. Fresh and processed fruits and vegetables, fish, live animals and meat, and nuts and spices now account for 50 percent of the total value of agri-food exports of developing countries, up from a 31 percent share in 1980/81 (Table 1.1).³ These products have higher income elasticities of demand and, in most instances, lower price volatility than many traditional developing country export commodities.⁴ The expansion of trade in fish, spices, and horticultural products has been facilitated, in part, by comparatively low and declining tariff barriers,⁵ as well as price pressure generated by expanding, year-round supplies.

Trade in these products is, however, governed by a growing array of food safety and agricultural health standards. These have been developed to address various risks including those associated with microbial pathogens, pesticides and veterinary pharmaceuticals, environmental contaminants (for example, heavy metals) and naturally occurring toxins (for example, mycotoxins), and the spread of plant pests and animal diseases. The increased attention to food safety and agricultural health risks stems in part from scientific advances, but it is also substantially driven by shifts in consumer demand and by a series of food safety scandals and disease outbreaks in industrialized countries.

Thus, the past decade has seen a proliferation and strengthening of sanitary and phytosanitary (SPS) standards, in the public and private sectors alike. The standards regime continues to evolve internationally, nationally, and within individual supply chains. In the public domain, there have been significant institutional changes in food safety oversight and reforms of laws and regulations. For long-held concerns (the impact of pesticides on health, for example), there has been a tightening of standards in developing as well as industrialized countries. At the same time, new standards are being developed and applied to address previously unknown or unregulated hazards.

³ Developing country exports of fresh and processed fruit and vegetables now exceed the *combined value* of their exports of tropical beverage crops, cotton, sugar and tobacco.

⁴ Spices are an exception. Some of these (for example, black pepper and vanilla) have experienced high international price volatility.

⁵ See Roheim (2005) and Diop and Jaffee (2005).

**TABLE 1.1 THE CHANGING STRUCTURE OF AGRICULTURAL TRADE
(PERCENTAGE OF EXPORT VALUE)**

	Total for developing countries		Total for industrialized countries		World exports	
	1980/81	2000/01	1980/81	2000/01	1980/81	2000/01
Traditional tropical products						
Coffee, cocoa, and tea	18.3	8.5	2.5	3.6	8.5	5.4
Natural fibers	8.0	3.3	4.5	2.6	5.9	2.8
Sugar and confectionery	10.5	4.3	3.9	2.3	6.4	3.1
Nuts and spices	2.4	2.8	0.7	0.8	1.3	1.5
Subtotal	39.2	18.9	11.6	9.3	22.0	12.7
Temperate products						
Meats, fresh and processed	7.2	6.0	14.8	15.4	11.9	12.0
Dairy products	0.3	1.1	7.9	7.6	5.0	5.2
Grains, raw and processed	9.3	7.0	21.6	11.6	16.9	9.9
Oilseeds + edible oil	4.6	5.5	4.8	4.4	4.7	4.8
Animal feed	7.5	8.5	7.7	5.3	7.7	6.4
Subtotal	28.8	28.1	56.9	44.2	46.3	38.3
Fish and horticulture						
Fish, fresh and processed	6.9	19.4	5.5	8.0	6.0	12.2
Fruits, vegetables, and flowers	14.7	21.5	13.1	17.3	13.7	18.9
Subtotal	21.6	40.9	18.6	25.3	19.7	31.1
Other products						
Tobacco and cigarettes	2.6	3.3	3.0	4.8	2.8	4.2
Beverages	1.1	3.6	6.9	11.5	4.7	8.6
Other products/processed foods	6.7	5.2	3.0	5.0	4.4	5.1
Subtotal	10.4	12.1	12.8	21.2	11.9	17.9
Total	100	100	100	100	100	100

Source: UN COMTRADE.

For many years, little attention was given to SPS standards and how they might affect the trade or competitiveness of developing countries. Such standards have been of little importance in relation to the traditional agricultural commodity exports of most developing countries, which include sugar, coffee, cocoa, tea, cotton, and tobacco. For these commodities, the primary bases for international competitiveness remain price and quality. Further, more traditional forms of trade protection and preferences remain contentious issues for these commodities.⁶

But the changing composition of developing country exports has substantially altered the bigger picture. The steady expansion in global trade in perishable high-value foods,

⁶ For the beverage crops, tariff escalation continues to be widespread. For sugar, cotton, and tobacco, tariff, quota, and producer subsidy distortions remain widespread. See various chapters in Aksoy and Beghin (2005).

together with parallel increases in problems connected with that trade, have drawn attention to the major disparities between countries in national standards for food safety and agricultural health, as well as the differential capacities of public authorities and commercial supply chains to manage the potential risks associated with producing and marketing these products.⁷

Although a wide range of developing countries have successfully expanded their exports of high-value and value-added agricultural and food products, there is growing concern that the growing stringency of food safety and agricultural health standards could undermine that progress, while posing insurmountable barriers to new market entrants within the developing world. The conventional wisdom, reflected in most analytical literature and public pronouncements, holds that the emerging product and process standards amount to a *barrier to the trade of developing countries and, in particular, to small producers and agro-enterprises*. Echoing criticism of the wider trade regime for agricultural products, many analysts, commentators, and developing country policymakers view food safety and agricultural health measures as disguised protectionist tools. ‘Scientific’ justification is now used to prohibit or restrict imports. Discrimination occurs when higher standards or more rigorous enforcement applies to imports than to domestic supplies. Even if standards are not used intentionally to discriminate against imports, there is concern that their growing complexity and the lack of harmonization among countries will impede the agri-food trade expansion efforts of developing countries.⁸

There is also concern that many developing countries lack the administrative, technical, and scientific capacities to comply with emerging requirements, presenting potentially insurmountable barriers in the short and medium term. A related concern is that the initial investment and recurrent costs required to comply with emerging standards weakens the competitive position of developing countries or compresses the profitability of their export-oriented activities.⁹ It is argued that the combined effects of institutional weaknesses and rising compliance costs will contribute to the further marginalization of weaker economic players, including small and poor countries, small and medium-sized businesses, and smallholder farmers.¹⁰

Much of this pessimistic, *standards-as-barrier* perspective focuses on official, mandatory standards, emphasizing the growing number of international disputes and complaints brought to the SPS Committee of the World Trade Organization (WTO), the limited capacities of developing countries to participate in international standard-setting organizations, the shortcomings of the SPS Agreement itself, and the difficulties posed by the strengthening or broadening of official SPS standards among major industrialized countries, especially the United States, Japan, and the European Union. Such analyses

⁷ A small number of developing countries are major exporters of cereals and soybeans, the trade in which has been recently affected by environmental and food safety concerns related to genetically modified organisms (GMOs).

⁸ See, for example, Orden and Romano (1996), Henson and Caswell (1999), and OECD (2003b).

⁹ For example, Stephenson (1997), Otsuki and others (2001), Jha (2002), Garcia Martinez and others (2002), Rotherham (2003), and Wilson and Abiola (2003)

¹⁰ See, for example, Chan and King (2000) and Dolan and Humphrey (2000).

often conclude with recommendations for adjusting the rules of the game or strengthening the ability of developing countries to negotiate trade rules, whether on an international or bilateral basis. Attention often focuses on the WTO and the standard-setting bodies explicitly mentioned in the SPS Agreement: the CODEX Alimentarius Commission (CAC), the International Plant Protection Convention (IPPC), and the Office International des Epizooties (OIE, also known as the World Organisation for Animal Health).

An alternative and less pessimistic global perspective might emphasize the *opportunities* provided by the emerging standards and the possibility that certain developing countries could use those opportunities to their competitive advantage. From this viewpoint, many of the emerging public and private standards represent a potential bridge between increasingly demanding consumer requirements and the participation of distant suppliers. Many of these standards provide a common language within the supply chain and raise the confidence of consumers in food product safety. Without that confidence, the market for certain products cannot be maintained, let alone increased, in turn jeopardizing international trade.¹¹

From this *standards-as-catalyst* perspective, the challenge inherent in compliance with food safety and agricultural health standards may provide a powerful incentive for the modernization of developing countries' export supply chains and give greater clarity to the SPS management functions of government. For example, increased attention to the adoption of 'good practices' in agriculture and food manufacture may induce changes in domestic food safety and agricultural health controls. Such changes could also benefit the domestic population, producers, and the environment. A share of the costs of compliance could therefore be construed as necessary investment that generates direct and indirect spin-offs from the adoption of new technologies and management systems. Rather than eroding the comparative advantage of developing countries, the enhancement of capacity to meet stricter standards could create new forms of competitive advantage and generate new employment. Hence, the process of standards compliance could conceivably provide the basis for more sustainable and profitable trade over the long-term—albeit with some highly visible winners and losers.¹²

In addition to considering the potential catalytic role of emerging standards, policymakers and analysts must consider movements in private standards and supply-chain governance, both of which have enormous implications for high-value and value-added agricultural and food products. Whereas *official measures* and restrictions continue to define trade and market access in matters of animal and plant health, in relation to food safety (and a growing array of other consumer concerns), *private standards*, industry codes of practice,

¹¹ The array of recent food scares and their enormous short or medium term impacts on consumer demand and international trade in beef and selected other livestock products fully attest to the importance of consumer confidence in food safety governance systems.

¹² While this is currently the minority view of the impact of SPS measures on developing countries, there is an expanding catalogue of cases where countries have been able to exploit market opportunities because of their greater capacity to comply with food safety or animal health requirements.

and other elements of supply-chain governance now rival the importance of official mandatory standards (Garcia Martinez and Poole, forthcoming).

Motivating these private developments has been the private sector's quest to avoid harm to reputations and to mitigate risks. For some products and industries these moves also have been part of commercial strategies of differentiation. The development of private food safety standards has been especially marked in industrialized countries (notably among major food retailers, food manufacturers, and restaurant chains), but private standards are becoming increasingly important in middle-income and some low-income countries as a consequence of investments by multinational companies and the competitive responses of local firms.¹³

The dichotomies between 'standards as barriers' and 'standards as catalysts' and between public and private standards (Table 1.2) suggest a complex reality. To understand the challenges and opportunities for developing countries of evolving food safety and agricultural health standards, close attention must be paid to the specifics of particular markets, products, and countries. It is also necessary to understand the strategic options and patterns of performance of individual developing countries in meeting those challenges and their ability to exploit emerging opportunities. Developing countries (and stakeholders therein) are strategic players in the evolving SPS and commercial environment—they are free to choose among and pursue alternative strategies. But as with most aspects of developing country trade and broader economic performance, one finds considerable variety of experience and skill in managing the challenges and opportunities presented by rising SPS standards.

**TABLE 1.2 ANALYTICAL SPHERES FOR STANDARDS
AND DEVELOPING COUNTRY AGRI-FOOD TRADE**

	Standards as barriers	Standards as catalysts
Public/official standards	Dominant focus in the literature and dialogue	Little recent attention; older literature on the value of grades and standards
Private standards and protocols	Some recent attention, especially related to supermarkets and the supply chains for fresh fruit and vegetables	Little attention in the literature

Understanding that variety and the range of choices open to developing countries, and exploring how the World Bank can support those choices, are the primary objectives of this report and of the broader research program on which it is based. A key aim is to rebalance the policy dialogue by examining experiences and trends that fall within all four quadrants of Table 1.2.

For the World Bank Group, food safety and agricultural health standards are relatively new areas of involvement. Yet, because of their strong linkages to economic growth and

¹³ See the growing literature on supermarkets in developing countries, including Reardon and Berdegué (2002); Weatherspoon and Reardon (2003).

poverty reduction, both lie directly within the World Bank's mandate. Facing growing demand from clients, the World Bank expects that the level of support it provides for strategic planning and capacity-building in relation to trade, food safety, and agricultural health will increase considerably in the coming years. Addressing food safety and agricultural health requires a holistic approach, involving many sectors—among them agriculture, trade, infrastructure, and public health. The World Bank can provide the cross-cutting analytical skills required for a successful holistic approach. In the rapidly changing world of global trade, timely policy adjustments and significant investments are often required; these, too, are areas of strength for the World Bank.

Both the public and private sectors play important roles in the management of food safety and agricultural health risks in relation to trade, where the chances for market failure are many (Box 1.1). Some potential sources of market failure are externality spillovers associated with disease and pest control, moral hazards in compliance with food safety controls, and the unequal access to information by different stakeholders. These conditions may require public sector interventions. The private sector, on the other hand, has the day-to-day responsibility for applying a range of agricultural, post-harvest, and processing practices that minimize and manage food safety and agricultural health risks. Awareness and capacity-building support, alongside other investments, may be needed in both sectors. The various components of the World Bank Group should work with their respective clients, in close collaboration with other development partners, to address those needs.

1.2 Objectives and Main Issues

This report summarizes a program of research coordinated by the World Bank and carried out from October 2002 to May 2004. The objectives of the program have been to:

- Highlight the major dynamics in the evolution of important SPS standards in selected industrialized countries, covering both public and private standards and the driving forces behind the observed trends.
- Explore the room for maneuver of suppliers of agri-food products in developing countries in the context of evolving regulatory (and commercial) changes and consider the range, appropriateness, and effectiveness of various strategic responses to those changes. Such strategies might involve public sector measures, private sector investments and adjustments, or various forms of collective action. The research considers the commercial, geographical, administrative, and other factors that facilitate or impair the pursuit of particular strategies.
- Develop a better understanding of the nature and level of the costs of achieving and maintaining compliance with international and country-specific SPS standards. Illustrations of the costs of noncompliance are provided as well. The research also identifies and quantifies direct and indirect benefits that may flow from the adoption of the rules, systems, skills, and facilities required to comply with standards.

- Develop a better understanding of the implications of emerging standards for market and industry structure and wider socio-economic effects. Evidence is sought on how compliance strategies (or the failure to comply with standards) have affected participation by smaller enterprises and farmers in export-oriented supply chains and (to a limited degree) their impact on employment patterns.
- Review the scope and nature of ongoing programs of international development agencies to provide technical assistance and other support for capacity-building in trade-related SPS management in low- and middle-income countries, and draw operational lessons from that experience.
- Draw out the operational implications of these research findings and identify entry points for the World Bank and other development agencies working in this field.

Several other features of the research program should be noted. First, the evolving challenges and opportunities posed by SPS standards are presented in a context of changing market dynamics. SPS-related factors are but one element, albeit an increasingly important one, among the many that affect international competitiveness in the production and marketing of high-value and value-added agri-food products. In reviewing trade performance trends, changes in industry structure, and changes in the distribution of incomes and opportunities, one must be careful not to ascribe those changes solely to the effects of standards, when other factors (new competition, logistical factors, macroeconomic developments, climate, and so on) may be of equal or greater significance. Some of the literature in this field falls into this trap and, therefore, may exaggerate the impact and compliance costs allegedly associated with changing standards.

Second, this work was not designed to challenge the scientific justification or current status of any particular SPS standard, whether set at the international level or by a particular country. Such challenges occur on a regular basis between bilateral trade partners and through the WTO's SPS Committee and international standard-setting bodies. In conducting our case studies, we heard a wide variety of concerns expressed by developing country regulators and private sector actors pertaining to specific measures being implemented in major destination markets. Those concerns are touched on in the case studies, but they do not feature heavily in this synthesis report.

Third, the range of standards being applied to food and agricultural products is expanding steadily. The World Bank research program has focused on SPS standards, with comparatively greater emphasis on food safety measures and somewhat less on plant and animal health controls. This relative emphasis was driven by our perception or understanding of the relative importance of emerging challenges across a broad set of countries. Addressing trade restrictions related to animal disease, such as the eradication of Foot and Mouth Disease (FMD), are so costly that only a modest number of developing countries are competitive enough to make it economically attractive to export to industrialized countries, although regional exports can be very important. In contrast,

dozens of developing countries are active in global trade in fruits and vegetables and fish products, where food safety issues have been prominent.

Product quality and labeling issues have also received less attention in our research than food safety and agricultural health, although there is often a strong degree of overlap between quality assurance and food safety. For example, the implementation of ISO 9000 is arguably a good basis for implementing a food safety management system such as hazard analysis and critical control point (HACCP). The research reported here also reflects relatively little attention to emerging environmental and social standards, which the private sector tends increasingly to package together with food safety in codes of practice and supply-chain protocols. Table 1.3 denotes the relative emphasis given to various types of standards in this research program. Under each heading, illustrative examples of standards are listed.

TABLE 1.3 EMPHASES GIVEN TO DIFFERENT TYPES OF STANDARDS IN THIS RESEARCH

Greatest Emphasis	Medium Emphasis		Least Emphasis	
Food safety	Plant/animal health	Product quality	Environmental	Social
Limits on pesticide use and residues	Surveillance requirements Quarantine requirements	Product composition standards	Controls on water, environmental contamination	Labor standards
Limits on veterinary pharmaceutical use and residues	Pest risk assessment requirements	Product cleanliness specifications	Controls on endangered species	“Fair trade” standards
Limits on microbiological pathogens	Sanitation requirements Fumigation requirements	Grading schemes	Environmental protection requirements	Animal welfare standards
Controls on food additives	Vaccination and disease prevalence requirements	Controls on nutritional and other claims	Protection of biodiversity	
Packing house/processing plant hygiene requirements	Restrictions on uses of certain livestock feeds and pharmaceuticals, such as antibiotics and growth promoters	General labeling requirements	Recycling requirements	
Traceability requirements	Traceability requirements Bio-security measures		Organic production standards	

Finally, this research program has focused on how SPS standards are influencing exports from developing countries to industrialized countries. It has not examined the emerging issues pertaining to South-South trade, food exports by industrialized countries to developing countries, or the growing level of SPS-related friction between industrialized countries. The decision to focus on exports from developing countries to industrialized countries reflects the current policy debates in the field and the development objectives underlying the current Doha round of trade negotiations. Given the growing level of South-South trade in food and agricultural products, future research should investigate how that trade is being facilitated or constrained by standards and related management practices and capacities.

BOX 1.1 WHY ARE FOOD SAFETY AND QUALITY STANDARDS IMPLEMENTED?

A well-functioning market provides incentives for firms to supply products that embody the characteristics of safety and quality that consumers demand, both because firms derive greater profits from doing so and because their reputation is critical for repeat sales (Mitchell, 2003). Under certain conditions, however, markets may fail to provide the safety and quality that consumers demand or that is socially desirable.

For example, consumers may be unable to judge the safety or quality of a particular food product at the point of purchase or prior to consumption. Because greater safety and quality can increase costs for firms, this lack of information may reduce the firm's incentive to incur those costs. Firms that have a greater level of information about the safety or quality of the products they supply may be able to gain a strategic advantage over consumers or over their competitors, leading to inappropriate price signals or false product differentiation on the basis of safety or quality. This situation is compounded by the fact that the safety and quality characteristics associated with food are typically complex and significant costs can be imposed on consumers when searching for products that meet their own particular demands and assessing their actual characteristics. Such transaction costs can be an impediment to market development.

When consumers eat unsafe food they not only impose costs on themselves (i.e. loss of income for time spent away from work), but they also impose broader costs on society as a whole, through the health care system. Normally, consumers do not take such costs--what economists call 'externalities'--into account when choosing the foods they buy and thus they tend to demand a lower level of food safety than society as a whole would prefer. Conversely, there can be positive externalities, benefits that accrue to other parts of society beyond the consumers themselves. One example is the protection of the environment when consumers buy 'environmentally friendly' products.

The government may implement food safety or quality standards in an attempt to address such market failures, as a means to achieve levels of safety or quality that are socially desirable and to reduce the associated costs. In extreme cases these may take the form of absolute bans on products. More generally, however, standards specify the ways in which food products are produced and/or their characteristics (for example ingredients, storage conditions etc.). In the latter case, governments may specify the safety and/or quality characteristics of the end product, but leave firms free to choose the most appropriate way in which to grow or manufacture such products. Further, in some cases they may also specify the information that must be disclosed to consumers and the format for this information.

This 'market failure' perspective presents public standards as instruments that correct inefficiencies in markets of food safety and quality. However, even a cursory observation of the prevailing standards environment provides illustrations where public standards have been implemented in the absence of any apparent 'market failure' or some other action may have been able to correct the failure at lower cost. The political economy perspective on standards acknowledges that public authorities are influenced by the interest groups their actions affect, whether private businesses, consumers or taxpayers, and that the standards they implement will reflect, at least in part, the power of these various actors. Thus, it is acknowledged that such private interests can 'capture' regulatory processes and steer them in directions that are to their economic advantage. In such cases, public standards can actually aggravate existing market failures and have considerable distributive impact.

Private standards are implemented by businesses and other entities, individually or collectively. Such standards evolve for very different reasons (see for example Henson and Caswell, 1999). Often they are devised to enhance economic efficiency, by facilitating communication between buyers and sellers or by ensuring the compatibility of product components or products that are consumed jointly. Or they can be the basis of the competitive strategies of firms-- a means to communicate with consumers and enhance reputation. Market signals are sufficient to induce the development of private standards. The role of the government is to ensure that such standards do not constitute or conceal anti-competitive practices.

1.3 Methods

This report is based on a series of case studies undertaken for this research program or in connection with complementary trade studies. One set of studies covered specific countries and commodity supply chains (Table 1.4), focusing on a few commodities to make comparisons possible. The commodities and products selected for attention represent many of the SPS ‘hot spots’, in the sense that they are the subject of a high number of restrictions and interceptions of trade consignments. Countries were selected to capture regional diversity of experience, to include supply chains whose exports are focused on different destinations (for example, the United States, the European Union, or Japan), to provide a range of experiences from very low- to middle-income countries and relatively small to quite large countries, to include both emerging and mature industries, and to build on the research team’s prior knowledge.

TABLE 1.4 COUNTRY AND COMMODITY CASE STUDIES IN THE 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 FMD control)
Nuts and spices	India (spices), Senegal (groundnuts)

The core methodology for the case studies is laid out in Henson and others (2002). The focus of attention has been on export-oriented supply chains and the challenges, strategies, costs, and benefits associated with compliance with external market SPS standards. In some cases, the interface between exports, standards compliance, and the domestic market was investigated.

Interviews with a representative range of processors/exporters, public officials, and producer/industry organizations were the primary source of information for most of the case studies. Some cases benefited from the existence of earlier survey work at the farm or enterprise levels. In several others, limited surveys of farmers, traders, and processors were carried out to provide stronger micro-level data. For two of the case studies, the research built on field work being done by doctoral students. For one case, a general equilibrium model was developed and applied to assess the distributional effects of a previous export ban and the potential distribution of benefits of a proposed disease control scheme. For the most part, the case studies provide descriptive statistics and use cost accounting to estimate compliance costs, rather than employing formal statistical approaches.

Complementing the country/industry case studies is a series of buyer studies, involving representative importers, brokers, retailers, and other distributors of shrimp and selected fresh fruits and vegetables in the United States, European Union, and Japan. These studies probed the changing dynamics of official and private standards in these markets,

buyers' perceptions of the capacities and performance of their developing country suppliers in meeting standards, and the roles of buyers in strengthening the SPS/quality management systems of their suppliers. A combination of formal and informal interviews was employed in this work.

The two sets of case studies were supplemented by a review of selected development agency experiences in building capacity for trade-related SPS management in low- and middle-income countries. Resource constraints limited this work to a review of documents and interviews with managers and staff at selected development agencies. No field visits were made. Documentation was reviewed from 31 projects in order to characterize the types of interventions being supported and, where possible, draw operational lessons related to project design and implementation. Selective rather than comprehensive, the review included projects from several multilateral and bilateral agencies.

This report also draws on some of the broader literature in the field of food safety and agricultural health, particularly that dealing with the structure and dynamics of commercial markets for high-value food products, as well as case studies of developing country responses to the emerging system of public and private standards.¹⁴ Use was also made of data and information provided by the WTO's SPS Committee, especially those pertaining to trade disputes and dialogue on food safety and agricultural health issues.

1.4 Structure of this Report

Chapter 2 opens with an overview of industrial country markets for high-value perishable foods, with an emphasis on the evolving set of public and private standards governing the trade and distribution of these products. The coverage is selective rather than comprehensive, the objective being to convey the growing scope and complexity of standards facing developing country suppliers and governments.

The strategic options available to developing country suppliers are explored in Chapter 3. Examples are drawn from our case studies and from other experiences to illustrate the application of various strategies by the public and private sectors. The examples demonstrate that developing countries do indeed have some room for maneuver, especially when they plan ahead and adopt proactive measures. Pro-activity and planning are not yet the norm, however, and many countries and industries find themselves adopting defensive coping strategies in the wake of new standards or actual trade interruptions.

Whatever the strategic approach adopted in response to emerging standards, there are associated costs and benefits. In Chapter 4 evidence is drawn from our case studies and other experiences to illustrate the incidence and relative magnitude of various types of costs and benefits. Not surprisingly, there is enormous variability in such costs and

¹⁴ Some very interesting and balanced perspectives are provided in Buzby (2003), Unnevehr (2003), and Josling and others (2004).

benefits, depending on circumstances. The apparent distributional effects of international trade standards are reviewed in Chapter 5, based in part on preliminary findings from the current research program. We find distributional impact at the international and industry-specific levels, in the (re-)structuring of particular supply chains, and through spillovers into the domestic economy.

Having examined the challenges for developing countries associated with food safety and agricultural health standards, we move on to a short overview of current development assistance for SPS capacity-building. Chapter 6 highlights prominent patterns of assistance and draws selective lessons based on a desk review of projects. A key finding is that much of the assistance in this field has been driven by tension or emergency—in the context of trade disruptions or disputes (or threats thereof)—and therefore has given little attention to strategic issues or to the underlying economics and sustainability of measures adopted in response to, or in anticipation of, standards. Chapter 7 ends the report by deriving implications for future World Bank activity in this field. Guiding principles and pertinent entry points for greater involvement by the Bank are provided.

CHAPTER 2

FOOD SAFETY AND AGRICULTURAL HEALTH STANDARDS IN INDUSTRIALIZED COUNTRIES: IMPLICATIONS FOR DEVELOPING COUNTRY EXPORTS OF HIGH-VALUE AGRI-FOOD PRODUCTS

This chapter analyzes the changing environment that developing country exporters of high-value food and agricultural products face as they penetrate industrialized country markets and strive to increase their market share. A series of well-publicized adverse events in recent years—Involving product tampering, inappropriate use of farm inputs, contamination by food-borne pathogens, animal diseases, and product adulteration—have drawn increased attention to food safety and agricultural health issues. Simultaneously, trends in consumer demand in industrialized countries have elevated food safety and quality over other product characteristics. Both developments, abetted by faulty risk management and poor communications, have shaken the confidence of consumers in many industrialized countries. In response, governments, private industry, and advocacy groups have taken steps to mitigate health, commercial, and political risks. Many of these responses have involved the tightening or extension of technical regulations and of sanitary and phytosanitary (SPS) standards.

The net result of these circumstances is a complex, variable, and dynamic environment for standards that constitutes a major challenge for developing countries aspiring to supply markets in the United States, the European Union, and Japan. As noted in Chapter 1, some regard the challenge as a problem that threatens to block market access for developing countries and reduce the profitability of their exports, while others see it as an opportunity to gain secure and stable access to remunerative new markets. This chapter provides an overview of some of the emerging trends in government regulation and private market governance, while subsequent chapters examine selected developing country responses in this environment.

This chapter begins with a brief overview of the emergence and nature of the international system of standard-setting on SPS matters. It next recounts a series of food safety and animal health events and crises that have sapped consumer confidence in industrialized countries. We then examine official and private sector responses in industrialized countries that have reshaped the rules by which existing and potential external suppliers to the industrialized countries must play. Finally, some broad implications of these changes for developing countries are noted.

2.1 Standards in the Context of Evolving Trading Frameworks

Standards have been used in agricultural commerce for thousands of years. Yet for most of that period their main purpose was to control or monopolize commerce rather than to facilitate trade or protect life, health, and the environment. The idea of developing national standards and using them to improve economic welfare seems to have originated on both sides of the Atlantic at about the same time. In the (now) industrialized countries, regulations related to food quality and safety were introduced in the early years of the twentieth century, while broader systems of national standards, both for food and

manufactured goods, were more fully developed during the First and Second World Wars.

After World War II, agricultural surpluses began to build in some countries due to a combination of economic recovery and expansion, mass application of improved technology, and government farm policies. In response, private agricultural associations in the United States, Europe, and elsewhere began working to expand global agricultural trade. Industry leaders realized that grades and standards could contribute to overseas market development—without them arms-length trading was much more difficult. Yet it was becoming increasingly evident that standards-related initiatives undertaken in isolation and at different times, with distinctive approaches and different nomenclature, could actually impede trade, increase commercial risk, raise transaction costs, and spawn disputes. As a result, a movement toward global harmonization began in agriculture (as in other sectors), led necessarily by international institutions with a broad mandate and public funding rather than by private organizations with a narrow set of concerns and limited budgets.

The United Nations Food and Agriculture Organization (FAO) was founded in 1945, with responsibilities that included nutrition and associated food standards. The mandate of the World Health Organization (WHO), created in 1948, encompassed human health as well as the establishment of food standards. In 1960, the first FAO Regional Conference for Europe endorsed the idea of an international agreement on minimum food standards. Three years later, the Codex Alimentarius Commission (CAC; hereafter referred to as Codex) was created as a joint FAO/WHO program. Its declared purposes were to protect the health of consumers and ensure fair practices in food trade.

Codex would promote coordination of all food standards work undertaken by governmental and nongovernmental organizations, determine priorities for new standards, and initiate and guide the preparation, finalization and publishing of regional and world-wide standards. Over the years, the Codex system has grown to comprise a collection of guidelines, codes of practice, and other food safety-related recommendations. Some of these are generic, including general guidelines for applying hazard analysis and critical control point (HACCP) systems. Others deal with supply-chain management measures for specific product groups (such as fresh fruit).

Two other standards-setting organizations emerged to play significant roles in the SPS arena. The Office International des Epizooties (OIE)¹⁵ was established in 1924, following an outbreak of rinderpest in Europe. Its main tasks have been: (1) global dissemination of information obtained from members on outbreaks of diseases; (2) collection, analysis, and dissemination of scientific information on disease control; (3) technical and institutional support to developing countries in their efforts to build capacity to control animal diseases; and (4) the setting of standards that countries can use to protect themselves against the introduction of diseases or pathogens.

¹⁵ In English, the World Organization for Animal Health.

The International Plant Protection Convention (IPPC), created as part of an international treaty signed in 1952, aims to “secure common and effective action to prevent the spread and introduction of pests of plants and plant products and to promote appropriate measures for their control.” The IPPC and various affiliated regional plant protection organizations have worked to promote good practices in their field, in part through the development of international standards and guidelines for pest risk analysis, plant quarantine, the establishment of pest-free areas, the use of irradiation as a phytosanitary measure, and so on. The original Convention has been revised or amended several times, most recently in 1997.

The linkages between Codex, OIE, and IPPC and the evolving trade framework for agricultural and food products were formalized in the years following creation of the WTO. Codex signed agreements with the WTO under which it would create trade standards that the WTO would use to resolve international trade disputes. The IPPC and OIE subsequently formalized their relationships with WTO. The legal basis for standards created by Codex, OIE, and IPPC was provided by the Agreement on the Application of Sanitary and Phytosanitary Measures (the SPS Agreement) and the Agreement on Technical Barriers to Trade. These were included among the Multilateral Agreements on Trade in Goods and annexed to the 1994 Marrakech Agreement that created the WTO.

The SPS Agreement permits measures that are “necessary to protect human, animal or plant life and health,” yet requires regulators to: (1) base measures on a scientific risk assessment; (2) recognize that different measures can achieve equivalent safety outcomes; and (3) allow imports from distinct regions in an exporting country when presented with evidence of the absence or low incidence of pests and diseases. In addition, the Agreement encourages (yet does not require) the adoption of SPS measures based on international standards, guidelines, and recommendations, making explicit reference to those of Codex, OIE, and IPPC. Countries basing their measures on those standards are automatically considered to be in compliance with the Agreement. Importantly, however, the Agreement protects the right of a country to choose its own “appropriate level of protection,” while guiding members to “take into account the objective of minimizing negative trade effects.”

The SPS Agreement thus sets out broad ground rules for the legitimate application of food safety and agricultural health measures, many of which have the potential to affect international trade. Scientific justification is called for wherever standards are deemed to not be based on established international standards. Even with ground rules, however, complications are inevitable, given the wide range of areas for which no agreed international standards exist and the many areas in which scientific knowledge is incomplete. Indeed, many of the controversies that have erupted question the legitimacy or appropriateness of measures taken in the midst of scientific uncertainty.

The standards, guidelines, and recommendations developed by Codex, OIE, and IPPC reflect international scientific consensus on good risk management and appropriate hazard tolerance levels. They can be used by developing countries in establishing their legislation and management systems related to SPS matters. Further, they provide

important benchmarks that developing countries can use in dialogue and negotiations with trade partners when technical or administrative disputes arise. However, in the context of developing country trade in high-value agricultural and food products to industrialized countries, the standards developed through the three sister organizations have frequently been superseded by national regulations or by specific requirements laid down by private supply-chain leaders. As the following discussion will highlight, there has been considerable change in both regulatory and private market governance in recent years.

2.2 Food Safety Events and Shaken Consumer Confidence

Consumers in industrialized countries have long had concerns about certain important dimensions of food safety, especially the presence of chemical residues and contaminants in food. Periodic outbreaks of food-borne illnesses have reminded people of the potential dangers of undercooked meats and spoiled foods. Beginning in the mid-to-late 1980s and continuing through the subsequent decade, a continuous series of food-safety events occurred—among them serious outbreaks of food-borne illness, new scientific links between animal and human diseases, and discoveries of tainted food and feed supplies—accompanied by an array of scares with uncertain or unfounded scientific bases (table 2.1). Alongside broader demographic and social trends (Box 2.1), these events have changed the nature of food markets in industrialized countries.

**TABLE 2.1 EXAMPLES OF MAJOR
FOOD SAFETY “EVENTS” IN INDUSTRIALIZED COUNTRIES**

Year	Event	Country
1987/88	Beef hormone scare	Italy/European Union
1988	Poultry salmonella outbreak/scandal	United Kingdom
1989	Growth regulator (<i>alar</i>) scare for apples	United States
1993	E.Coli outbreak in fast-food hamburgers	United States
1996	Brain-wasting disease linked to BSE	United Kingdom
1996/97	Microbiological contamination—berries	United States, Canada
1995-97	Avian flu spreads to humans	Hong Kong, Taiwan
1999	Dioxin in animal feed	Belgium
2000	Large-scale food poisoning—dairy	Japan
2001	Contaminated olive oil	Spain

Source: Authors

BOX 2.1 DEMOGRAPHIC AND SOCIOECONOMIC TRENDS INFLUENCE FOOD PREFERENCES AND FOOD-SAFETY CONCERNS

Patterns of consumption of high-value agricultural and food products continue to evolve in industrialized countries in conjunction with demographic and socioeconomic trends. In all industrialized countries, the share of income spent on food has been shrinking. At the same time, consumption of higher-value products, especially fresh produce, fish, and poultry, has risen with *disposable incomes*, reflecting the fact that such products have higher income elasticities of demand. Increases in disposable income are also associated with greater interest in foreign travel, which tends to stimulate a desire for a greater variety of food and greater experimentation with cooking. This favors exotic fruits, vegetables, condiments, and processed or prepared ethnic foods.

Demographic and lifestyle changes also influence food preferences. The United States and many European countries are experiencing significant changes in the *ethnic composition of their populations* due to migration and differences in birth rates. Lingering preferences among immigrants for foods from home, along with spillovers of immigrants' preferences into the broader population, are altering overall consumption patterns. At the same time, *the population is aging*, especially in Japan and certain European countries. Older consumers tend to prefer foods perceived to be healthy and tend also to be concerned with standards, for example, those associated with unacceptable pesticide residues or the chance of getting sick from microbial contamination. *Lifestyle changes* also matter. Fueled by two-income households and the recognition of "time scarcity," eating out is increasingly common in the United States, Europe, and Japan, as is demand for precut produce, prepared meals, and other ready-to-eat food.

Source: Authors

Several of these events involved serious illness and loss of life. But the adverse effects of these and other events were amplified by a combination of poor communication about risks and, in some cases, mismanagement of crisis responses on the part of governments and private companies. Both the mainstream and tabloid media seized on the events, often magnifying public concerns by emphasizing the potential threats to human health, the influence of vested interests unconcerned with consumer protection, and the alleged ineptitude of governments. Each new event further eroded the confidence of consumers in the safety and integrity of certain food products, in national and regional systems of regulation, and (at least in Europe) in the broader scientific community supporting the agri-food system. Many came to believe that the existing regulatory apparatus was more geared toward protecting the interests of farmers and food distributors rather than consumers. Public disagreements among scientists in different countries about food risks further sapped consumers' confidence.

While the depth and breadth of consumer concerns varies among industrialized countries, a decline in food-safety confidence has been a common phenomenon. In some instances, the political and consumer backlash has been severe, undermining the careers of several health and agricultural officials, bringing down at least one national government (in Belgium), causing financial losses and even bankruptcy for various companies, and severely undermining regional or international trade in certain products. Over time, consumers in industrialized countries have intensified their search for alternative sources of information (usually from consumer and environmental groups) and for alternative foods, including organic products.

2.3 Official Responses to Food Safety Concerns

The decline in consumer food safety confidence poses both political and commercial risks, just as the wave of food safety outbreaks and scandals has revealed weaknesses in underlying regulatory and crisis-management systems. Government action in response to these developments has brought about a new paradigm in food safety regulation and management (Box 2.2). Elements of this new paradigm, and other trends in food safety management, include the following:¹⁶

Institutional independence and a sharper focus on public health. In the past, some agencies responsible for food safety also had mandates related to agricultural or industry promotion, yielding potential conflicts with the goals of public health and consumer protection. Broad institutional shifts have taken place to create independent regulatory bodies focused on the latter two goals. In Europe, independent food safety agencies have been created in France, the United Kingdom, and several other countries. A new Food Safety Authority has been created at the level of the European Commission, and oversight for an array of food safety matters has been shifted to a greatly empowered Health and Consumer Protection Directorate General. Australia and New Zealand have created distinct agencies for food regulations and standard-setting, while in Japan an independent food safety advisory commission has been established. In the United States a federal Council on Food Safety was established to coordinate the efforts of various agencies. Some countries have sought to coordinate regulatory arrangements with their trading partners, requiring the existence of a competent authority to oversee the application of various regulations (Box 2.3).

Full supply-chain perspective. Regulatory authorities are increasingly adopting a farm-to-table perspective in addressing food safety hazards. Because hazards threaten the food chain at many different points, their appearance must be monitored at each point. Needed interventions, including regulations, could apply at the point of production or capture, processing or distribution, and also in consumer households. One of the regulatory dimensions of the full supply chain perspective has been growing attention to the traceability of animals, raw materials, and products. The actual application of officially mandated traceability arrangements has gone furthest in relation to beef cattle, with partial implementation in the European Union, Japan, Canada and parts of Australia (Clemens and Babcock 2002)

¹⁶ This discussion is based, in part, upon Roberts and Unnevehr (2003) and Caswell (2003).

BOX 2.2 THE U.K. FOOD SAFETY ACT (1990)

This Act, passed in the wake of food scares related to Salmonella and other issues in the mid-to-late 1980s, was a major watershed event in the United Kingdom, one that foreshadowed future legislation at the EU level. The Food Safety Act radically transformed quality management systems in Britain's food sector and established greater clarity in control, enforcement, and responsibilities for food safety. It made firms responsible for the safety and quality of their food inputs, the conduct of their suppliers, and the safety of consumers. Both reputation and financial resources were at stake if firms failed to prove due diligence in detecting and preventing problems in the food chain. Under the Act, any supplier of a branded product would be liable for the safety of that product unless they could show due diligence. All fresh produce sold in unpackaged form was considered to bear the brand of the retailer. These liability provisions went further than those that would subsequently appear in continental Europe. As a result, they provided a strong stimulus for private, self-governing actions that subsequently took the form of: (1) a set of good agricultural practices (for example, the Assured Produce Scheme); and (2) a protocol of good hygiene practice (the BRC Technical Food Standard). These, in turn, became part of the foundation for wider food safety initiatives by the private sector in Western Europe.

Source: Loader and Hobbs (1999); Henson and Caswell (1999); Holleran and others (1999).

Increased emphasis on adoption of HACCP systems. Although HACCP systems have been used voluntarily by food processors and distributors for many years, recent regulatory measures have made them mandatory in some industries supplying certain markets. Between 1995 and 2001, several U.S. regulations made it mandatory to apply HACCP in meat, poultry, and fish processing plants and in production of fruit juices. The U.S. Food and Drug Administration (FDA) inspects a limited number of plants for compliance, while in the fish sector importers must attest that their suppliers are implementing effective HACCP systems. Canada also requires use of HACCP in the fish processing sector. Various EU member states have HACCP requirements, and all suppliers of dairy, meat, and fish products are required to have such systems, with oversight provided by national authorities and periodic inspections by EU technical experts.

Increased use of scientific risk assessment. Scientific risk assessments—covering the identification of risk sources and incidence as well as alternative mitigation strategies—are being more widely applied to new and familiar hazards. Such assessments are often undertaken to determine the need for new regulations. Under the SPS Agreement, assessments are required when a government proposes to adopt a measure that is not based on an agreed international standard, guideline, or recommendation (or when an international standard does not exist). Roberts (2004) notes a complementary process within Codex and the other major international standards-setting organizations, which, in the past decade, have devoted more of their time and resources to developing common approaches to risk identification, assessment, and management (meta-standards) than to product standards *per se*.¹⁷

¹⁷ Still, this is not to imply that only scientific factors influence national food safety regulations. Political, commercial and other considerations are still, undoubtedly, important in various circumstances.

BOX 2.3 REGULATION OF FOOD AND FEED CONTROLS IN THE EUROPEAN UNION

In 2003, the European Commission (EC) put forward a proposed regulation dealing with food and feed controls. The proposal was approved by the Council of Europe in April 2004 and will enter into force on January 1, 2006. The new regulation calls for:

- A harmonized EU-wide approach to the design and development of national food and feed control systems, together with a common approach to imports of food and feed
- General audits to verify compliance or equivalence of third-country legislation and control systems with EU requirements
- Enforcement measures, including criminal sanctions, at the national level to address problems of noncompliance with feed and food law, animal health and welfare rules.
- Technical assistance to developing countries, including training of control officials from these countries.

The Regulation provides for new general rules applicable to all food and feed production in the European Union and abroad. Specific controls that have already been widely applied, for example on animal and fish products, will remain. The scope of the proposed regulation is wider than existing legislation and closes several loopholes. For example:

- It introduces a common approach to imports of food of non-animal origin, such as fruit and vegetables.
- It introduces a general requirement for accreditation of official laboratories and rules for the delegation of control tasks to nongovernmental bodies.
- It requires EC member states to present and report on multiyear control plans. Similar requirements will be made for third-country suppliers.
- It provides for the creation of a list of products of non-animal origin that are known to pose serious risks to human or animal health and that should be subject to stricter inspection at the point of import.

For all imported food and feed, the general principle is that the product should meet EU standards (or equivalent standards). Countries must be approved for the relevant commodity, and products must originate in an establishment that is approved to export to the European Union. Lists will be maintained at the EU level of countries and establishments from which imports are permitted. To be listed, a non-EU country must provide guarantees that exports to the European Union meet, or are equivalent to, the standards prescribed in the relevant EU legislation. Such guarantees will be verified through inspections by the Commission's Food and Veterinary Office. The regulation allows for more specific conditions on the importation of particular types of food and feed. The new conditions may replace some or all of the current import requirements.

The new regulation will generalize, across all or most food and feed products, the system of pre-approval of countries and establishments that has been applied by the European Union in the fish sector for much of the past decade. The regulation notes the possibility of a phased introduction of certain requirements and possible transitional measures while management systems in third countries are being strengthened. Specific reference is made to assistance to be provided to developing countries.

Source: Authors

Intensified border inspections. Even with the increased attention to process requirements and oversight by competent authorities, several industrialized countries have intensified their level of border inspections to screen for food safety and other hazards. This is especially evident in the United States. Between 2001 and 2003, there was a six-fold increase in the number of product inspections undertaken by the FDA, in part due to heightened concern about bio-terrorism.¹⁸ Intensified border inspection has also taken

¹⁸ Between 2002 and 2003, the number of ports where the FDA assigned inspection staff increased from 40 to 90. A large increase in the FDA's budget for food safety enabled it to hire some 655 new field personnel.

place in the European Union, as evidenced by a massive increase in the number of product notifications and alerts that have occurred for imported products in recent years.¹⁹ To a somewhat lesser extent, Japanese authorities have increased their levels of inspection of imported foods, especially of fish products.

Greater transparency. The risk assessments mentioned above are generally available for public inspection. In most countries, more elaborate consultative processes have been put in place when proposed food-safety legislation is being debated. Regulatory enforcement data for certain countries, including on border rejections by inspection authorities, is now more readily available. Official websites now provide extensive information on government programs and budgetary resources devoted to food safety. A further indication of this greater transparency is that industrialized countries account for the vast majority of the notifications of new measures provided to the WTO's SPS Committee.

Greater stringency and broader application of standards. Regulatory standards in several areas have been made more stringent in response to new scientific evidence and increased consumer concerns. The new stringency can be found both in horizontal (general food) standards as well as vertical (product-specific) standards. Regulations on pesticide use and tolerance levels for pesticide residues represent a clear example. Over the past decade, the European Union has issued a series of directives and regulations leading to new arrangements and more stringent criteria for the (re-)registration of agro-chemicals, a harmonized (and generally more stringent) set of maximum residue limits (MRLs), and a more intensified program for monitoring pesticide residues. A parallel tightening of pesticide-related regulations has occurred in the United States. At the same time, regulatory standards have been put in place for a range of comparatively new food safety concerns and hazards—among them heavy metals, selected mycotoxins, allergens, potential BSE-related hazards associated with animal byproducts, and genetically modified organisms (GMOs).²⁰

New concern for bio-terrorism. The possibility of intentional contamination of food, water, or the atmosphere with pathogens, chemicals, or radiation has long existed. Yet the level of concern, planning, and cooperation on this topic has risen rapidly since the events of 9/11. Most obviously in the United States, but also with quiet intensity in the European Union, Japan, and other countries, the heightened perception of risk has caused significant changes in policies, regulations, and procedures relating to all merchandise trade. The U.S. Bio-terrorism Act of 2002, in particular, mandates new requirements for food facilities and imported food.

Precaution in the face of scientific uncertainty. Article 5.7 of the SPS Agreement allows WTO members to adopt provisional measures to protect human, animal, or plant health

¹⁹ Part of this increase is due to the greater stringency of certain standards (for example, aflatoxin in nuts), yet the interceptions are largely due to enhanced capacities for inspection.

²⁰ The emerging standards pertinent to GMOs fall within several spheres, including food safety, environmental management, and intellectual property rights. The trends and directions in these regulations are not discussed here because they are, as yet, of limited importance in relation to trade in the higher value food products covered in our research program.

when a potential hazard exists, yet where scientific evidence is insufficient to draw firm conclusions. Members enacting such provisions are obliged to obtain “additional information” about the hazard. The language of the Article is rather vague, however, and provides wide latitude for members to maintain a provisional measure for a considerable period of time. The European Union, in particular, has applied a precautionary principle to genetically modified foods, about which there is significant public concern but no firm scientific consensus. A more general application of the precautionary principle has been the very fast and severe measures taken by industrialized and developing countries in the face of recent outbreaks or even isolated incidents of animal disease in traditional exporting countries.²¹ The strong reaction to these events is partly a response to past policy mistakes, when insufficient precaution or response measures were taken in relation to a risky SPS event. In general, the precautionary approach is being deployed in circumstances where there is a *possibility*, perhaps remote, for dire or uncontrollable consequences for health or the environment.

Common trends, differing requirements. There are some common trends in food-safety regulation in industrialized countries, but countries still are not adopting identical product standards or strongly aligning their process and inspection requirements. As Caswell (2003) notes, evolving regulatory systems still contain a mix of old and new requirements and reflect different perceptions of risk, levels of adopted precaution, scientific traditions, and climatic and geographical circumstances (which themselves affect underlying risks). The growth in industrial country notifications of SPS measures to the WTO indicates that most new measures differ from international standards or cover areas where no international standard yet exists. Roberts and others (1999) note that, in 1995–99, only 22 percent of the notifications issued by high-income countries concerned measures for which international standards existed.

Variability of official standards can be found in many product fields:

- Henson and Mitullah (2004) contrast the varied standards that developing countries must meet to gain and maintain access to the U.S., European, Japanese, and Australian markets for fish and fishery products. While there are some overlapping requirements, notably the increasing emphasis on the application of HACCP, differences remain in regulatory and technical requirements.
- Mathews and others (2003) highlight the range of product and process standards required by countries to minimize the risk of salmonella in poultry products. They note that several middle-income countries effectively discriminate against imports by having zero-tolerance standards for salmonella for imports, yet lack the surveillance and eradication systems to attain this standard in domestic supplies.
- Dohlman (2003) and Otsuki and others (2001) discuss the significant differences among countries, not only in maximum permitted levels for aflatoxin in cereals and nuts, but also in the sampling and testing methods used to assess conformity.

²¹ Hundreds of millions of dollars of trade was affected by the discovery of one BSE infected cow in Canada in 2003 and a similar discovery in the United States in 2004.

- Jaffee (2003) notes that, despite efforts to harmonize regulations for pesticide residues for fresh fruit and vegetables imported into the European Union, there remain wide variations in operative standards owing to different country approaches to surveillance and enforcement.

Requirements governing the importation of dried chili spices illustrate the reliance on different types of standards by regulators and others (Table 2.2; based on interviews with Indian exporters). Historically, international trade in spices was governed by a system of quality grades and cleanliness parameters. Since the early 1990s, health and hygiene specifications have gradually been incorporated into commercial spice supply chains and, to a lesser extent, into official regulatory systems. The vast majority of these product and process standards were not designed specifically for spices, but derive from general food standards related to microbiological contamination, pesticides, food additives and food labeling.

India's largest markets for chilies are in South and East Asia, where quality parameters remain the predominant standards. Some countries maintain regulations related to pesticide residues and aflatoxin, but they are minimally enforced, and little, if any, commercial importance is devoted to these parameters. The United States is the next most important external market for Indian chilies. In that market there is strong official and commercial attention to product cleanliness, labeling for allergens, and proper fumigation. Very modest attention is given to other food safety variables for this commodity. In Australia, a secondary market for Indian chilies, the strictest attention is given to matters of plant health. When supplying Australia, Indian exporters are requested to undertake especially intensive fumigation using methyl bromide. In contrast, this fumigant is already banned for use in and to the European Union (as required under the Montreal Protocol) and is being phased out in the United States.

The European Union is only a secondary market for Indian chilies, because of a combination of consumer taste preferences (notably for milder chilies) and SPS-related constraints. In recent years European officials have paid increasing attention to an array of food safety issues including pesticide residues, aflatoxin, heavy metals, and, most recently, food colorants. Yet, within the European Union, there are apparently significant differences in regulatory interest and intensity of oversight for particular issues. For example, Indian exporters report that each and every consignment of dry or ground chilies entering Spain is subjected to testing for pesticide residues. In Germany, a sample of such consignments (perhaps one in six) is tested. In contrast, in the United Kingdom most pesticide residue testing is undertaken for products at the retail level, and spices are not generally included. Past product interceptions due to the incidence of aflatoxin occurred in some countries but not in others.

**TABLE 2.2 PRODUCT/PROCESS REQUIREMENTS
FOR INDIAN DRIED CHILIES IN SELECTED MARKETS**

	United States	South Asia	East Asia	European Union	Australia
Quality					
Compliance with physical and chemical parameters	D4	D4	D4	D3	D4
Compliance with cleanliness parameters	A3	D4	D4	D3	D4
ISO 9000/1 certification	D1	D1	D1	D3	D1
Food safety					
Compliance with MRLs	C2	C2	C2	B2	B3
Compliance with aflatoxin limits	C2	C1	C1	B2	C2
Compliance with heavy metal limits	D2	D1	D1	B1	D1
HACCP program requirement	D1	D2	D2	D2	D2
Allergen policy	C4	D1	D1	C4	D1
Plant health					
Fumigation requirements	A4	D2	D2	D2	D4
Phytosanitary certificate	D1	D1	D1	D1	A2

Legal Requirement:

- A Legally mandated and strictly enforced
- B Legally mandated, spot/sample enforcement
- C Legally mandated, minimal enforcement
- D Not legally mandated

Source: Jaffee (forthcoming).

Commercial Requirement:

- 4 Fully required for commercial purposes
- 3 Mostly required for commercial purposes
- 2 Not required, but somewhat beneficial commercially
- 1 Not required and unnecessary for commercial purposes

BOX 2.4 DISCRIMINATION IN THE APPLICATION OF SPS STANDARDS?

The SPS Agreement has not eradicated the differential application of standards—indeed 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. But an effective risk-management system will go beyond the prioritization to differentiate 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 products imported 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 discussed cases where protectionism was assumed to have been an important 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 had differing perspectives on the state of scientific knowledge or the need to make allowances for uncertainty. Perhaps the most prominent case is the dispute between the European Union and the United States over restrictions on exports of beef produced with the use of hormones (Bureau and others, 1998).

Thus, questions remain about the use of food safety and agricultural health controls to discourage imports. One question is whether foreign suppliers are required to 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 deriving from imports than from domestic sources. Some countries have restricted supplies from areas where a plant pest or animal disease occurs, even though the pest or disease in question was prevalent domestically. Similar observations can be made for some food safety controls. For example, the United States has long argued 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. Several other cases of discriminatory practices have been brought to the attention of the SPS Committee and addressed in bilateral or multilateral discussions.

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 agricultural and food product 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 provided by private entities, especially supermarkets and their buying agents, rather than from official systems of surveillance and product monitoring. Further, in many ways the methods of control they face are more visible in their effects, in that compliance is assessed at the border and on this basis entry may be denied. Domestic suppliers, by contrast, are regulated through inspection of their processing facilities, with a focus on system-based controls and market surveillance. Conversely, anecdotal evidence suggests that regulatory 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. FDA will undertake inspections of all domestic firms that produce low-acid canned foods, yet the same inspections are undertaken 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 inspects only 1 to 2 percent of the more than six million consignments of food and cosmetic products imported each year.

Source: Jaffee and Henson (2004).

2.4 Selected Private Responses to Consumer Concerns and Food Safety Events

For economic actors in food supply chains, reduction in the risk of product liability and loss of reputation have generally been the ‘stick’ driving increased involvement in food safety standards, while the ‘carrot’ has been the quest for greater consumer responsiveness, industry competitiveness, enterprise profitability, and market sustainability. The series of food safety events over the past two decades has sparked an array of defensive and offensive measures by primary producers, food manufacturers, and food distributors in industrialized countries. Some of these have been stimulated by regulatory measures, while others have either predated official regulations or filled perceived gaps in market governance that have been of concern to consumers. Many of these private measures continue to evolve and to strongly affect the terms and conditions under which developing country suppliers access and compete in industrialized country markets. Important and related structural changes in food marketing systems in these countries are having similarly strong impacts (Box 2.5).

It is not easy to generalize about private sector standards, given their variety and differences in their relative importance in different commodity fields. Nevertheless, some fairly widespread patterns can be discerned among supply-chain leaders, including food retailers, food manufacturers and major food service distributors. These include the following²²:

Increasing pressure on suppliers to adopt good hygiene, risk management, and quality control practices. Traditionally, food-chain leaders focused on the capacities of their suppliers to meet their requirements in terms of volume, continuity, and price competitiveness. Now, many require suppliers to apply an array of process and production methods embodied in so-called good agricultural practices (GAP), good manufacturing practices (GMP), and HACCP and other systems. These are frequently specified in company codes of practice and supply contracts. Some pressures in this direction were stimulated by regulation, as when British farmers’ organizations and retailers jointly developed an integrated crop management partnership and later the Assured Produce Scheme in response to the liability provisions of the U.K. Food Safety Act. Other examples predate legislation, as when McDonalds moved to require its suppliers to adopt HACCP systems many years before the USDA made this a requirement in the beef sector.

²² For a fuller elaboration of these trends see Willems and Roth (forthcoming), Lamb and others (forthcoming), Jonker and others (forthcoming), Garcia Martinez and Poole (forthcoming), and Jaffee and Masakure (forthcoming)

BOX 2.5 IMPORTANT CHANGES IN THE STRUCTURE AND CONDUCT OF FOOD MARKETING

Food marketing all over the world has changed rapidly over the last 25 years, not just in industrialized countries, where trends tend to start, but also in developing countries. Among the major trends that have affected standards are the following:

- *Consolidation of food retailing.* Just 30 grocery retailers together achieved more than \$1 trillion in total revenue in 2001, equal to about 10 percent of all global food sales. Within this elite group, the top 10 retailers accounted for 57 percent of the combined total. Concentration ratios tend to be highest in Europe. For example, the top five supermarket companies in France reportedly have a 90 percent market share, while in the Netherlands it is 64 percent and in Germany 60 percent. Although consolidation in the United States accelerated greatly in the late 1990s, the top five supermarket chains still had only about 35 percent of the overall market in 2004.
- *Declining importance of or more specialized roles for wholesale or terminal markets* in many major marketing areas. Whereas in the past wholesale and terminal markets represented 20 percent or more of food sales, and sometimes even more for perishables, in most industrialized countries they now account for a smaller percentage—on the order of 10 percent. Notable exceptions include fish marketing in Japan and fresh produce marketing in France. Many wholesale markets continue to play their traditional roles or serve as a buffer for overages and outages, as an outlet for second-quality or distressed products, or as a source for small shops and restaurants. Others have taken on more specialized roles, especially in servicing the ethnic food segments in some markets.
- *Rapid growth in the food service industry.* The food service industry has grown rapidly in the United States, where in 2002 some US\$415 billion (46 percent of total food expenditures) was spent away from home in hotels, restaurants, and institutions. In 2002, the food service sector in the EU-15 had sales of around US\$321 billion, equivalent to one-third of all food sales at the retail level. The share of food service in total food expenditures in Japan is somewhat lower (accounting for 26 percent in 2001), in part because of countermoves by supermarkets that now offer easy-to-prepare or already prepared foods for consumption at home.

The consolidation of food retailing has resulted in extraordinary market and purchasing power for market leaders; a strong trend toward global sourcing; the introduction of preferred-supplier arrangements; greater emphasis on shared responsibility for the bottom line; supply chain integration and rationalization; elimination of middlemen; lower average prices; and lower variability in prices for contract or program suppliers. The substantial growth of food service in industrialized countries has been associated with high demand for a wide range of processed and semi-prepared foods; large-volume contracts; extreme aversion to food safety and other product risks; and, in practice, almost no direct foreign sourcing.

Measures to harmonize requirements under umbrella schemes. To many stakeholders, the emerging company codes of practice became increasingly confusing and problematic, owing to their seemingly different standards, multiple inspections, and large oversight costs for supply-chain leaders. In response, firms have organized collective action to formulate and apply joint or industry-wide protocols embodying the core building blocs of GAP, GMP, and HACCP. One prominent initiative at the level of primary production has been the development of the EUREPGAP protocol for fresh fruit and vegetables, as well as more recent efforts to develop EUREPGAP protocols for flowers, coffee and aquaculture. For food packers and manufacturers, quality and safety management systems have been developed by the British Retail Consortium, the Safe Quality Food Initiative, and others. The Global Food Safety Initiative has sought to benchmark several of the food packing and manufacturing standards and launch an early warning system for food safety to parallel similar systems in the public sector. The efforts to harmonize private

standards have taken place at national, regional, and international levels, creating a complex and sometimes confusing picture—and set of demands—for developing country suppliers.

Increasing testing and auditing, including third-party certification. Food-chain leaders have been intensifying their efforts to test suppliers' produce for various hazards and contaminants and to audit the production practices and management systems of suppliers. All formal industry protocols now involve arrangements for third-party certification, in the interest of objectivity and transparency and to shift some compliance costs to upstream suppliers. Moreover, the demand for certified quality control and safety management is now occurring in intermediate product industries (such as spices) that previously relied only on buyer product testing for quality conformity. Certification of food companies for ISO 9000, formerly quite rare, has now become increasingly common, especially for those that supply Europe.

Bundling safety, environment, and social standards. An increasing number of company codes of practice and industry protocols extend beyond quality and safety management requirements to include environmental and social standards. This is evident in the most recent version of the EUREPGAP protocol, which includes many requirements and recommendations in these areas. In the fisheries field, food safety requirements are being increasingly supplemented by requirements for sustainability. For example, the Marine Stewardship Council and the Aquaculture Certification Council are developing certification programs focusing on environmental mitigation measures and sustainable fishing. Further, several major food manufacturers and restaurant chains have started a Sustainable Agriculture Initiative. There is also a plethora of schemes to certify sustainable and socially acceptable practices in beverage-crop production systems.

Tendency to consolidate supply chains. The application of category management and the development of networks of preferred suppliers is leading to the consolidation of supply chains. Many supply chain leaders are building long-term relations with a select number of suppliers that can meet their requirements for volume, continuity, price competitiveness, safety, and sustainable practices. The need for certified food-safety systems is one of several factors that is contributing to supply-chain consolidation. Advances in logistical and information technologies are also contributing factors.

The proliferation of standards in the private sector has created a complex and fast-moving environment that developing country suppliers need to understand, adjust to, and even anticipate. The complexity is illustrated by the following example. One of our case studies related to Kenyan exports of fresh vegetables. Ostensibly, the European Union is moving toward a harmonized system of regulations covering quality control, food hygiene, pesticide-related matters, and phytosanitary measures. In the private sector, groups such as EUREPGAP are striving to harmonize supplier requirements. Yet formal requirements and enforcement of those requirements continue to vary significantly between countries and particular market segments and supply chains within countries. Exporters supplying particular segments of the British market, for example, face very different requirements (Table 2.3). The most stringent requirements are those associated

with supplying the leading supermarket chains. This is contrasted with the situation in the ethnic food distribution segment, where basic quality and continuity criteria are important, but little or no specific attention is given to food safety.

**TABLE 2.3 PRODUCT AND PROCESS STANDARDS
FACING KENYAN FRESH VEGETABLE EXPORTERS IN SELECTED MARKETS**

	U.K. supermarket	U.K. wholesale for temperate vegetables	U.K. ethnic product market	France/ Germany/ Belgium	Holland and Scandinavia	Australia and New Zealand
Quality/service						
Product conformity	D4	D3	D2	D3	D3	D3
Supply continuity	D4	D3	D3	D3	D3	D3
Packaging specifications	D4	D3	D2	D3	D3	D3
Food safety						
MRL tolerances	B4	C1	C1	C1	B1	A4
HAACP system	D4	D2	D1	D1	D2	D3
Microbiological testing	D2/D4	D1	D1	D1	D1	D2
Product traceability	D4	D2	D1	D1/2	D2	D3
Other						
Phytosanitary certificate	A	A	D1	A	A	A
GAP/ environmental planning	D3	D1	D1	D1	D2	D2
Social welfare planning	D2	D1	D1	D1	D1	D2
<u>Legal Requirement</u>		<u>Commercial Requirement</u>				
A Legally mandated and strict enforcement		4 Fully required for commercial purposes				
B Legally mandated and spot/sample enforcement		3 Mostly required for commercial purposes				
C Legally mandated yet minimal enforcement		2 Not required. Somewhat beneficial commercially.				
D Not legally mandated		1 Not required and unnecessary for commercial purposes				

Source: Jaffee (2003)

On the European continent and elsewhere, Kenyan (and other developing country) exporters face a diverse set of operative standards, reflecting a combination of factors including consumer preferences, private commercial strategies, national laws, and national enforcement themes and capabilities.²³ Because many standards are essentially demand driven, this regulatory and private governance landscape is fluid and subject to sudden changes. Kenyan producers expect that demands from their European (continental) clients will become more stringent in the coming years, although price-based competition (rather than standards-based differentiation) should remain paramount in some markets.

2.5 Emerging Dynamics in Trade-Affecting Animal and Plant Health Standards

Animals and plants are susceptible to pests and diseases that can seriously undermine agricultural productivity. Those pests and diseases can spread within and between

²³ Garcia Martinez and others (2002) examine various firm-specific factors, sectoral characteristics, and regulatory and other institutional variables giving rise to varied private sector standards in Europe.

countries through movements of animals, goods, and people. A variety of containment and eradication measures can be taken to limit damage and facilitate trade. Animal health and phytosanitary measures (hereafter referred to jointly as agricultural health measures) differ from food safety standards, both in their geographical scope and in their underlying economic characteristics. In matters of agricultural health, far greater onus is placed on public sector control and oversight measures than is typically the case with food safety.

The overall incidence of catastrophic outbreaks of animal disease and pest infestations has probably declined over the past two decades. Notable successes include the eradication of foot and mouth disease (FMD) and classical swine fever in Europe, and the practical eradication of Rinderpest in Africa. Nevertheless, major challenges remain. The OIE reports that, in 2001, there were some 13,000 outbreaks of FMD in cattle and more than 2,000 outbreaks of Newcastle disease in poultry. Increased animal and human concentrations have led to the emergence of new or variant diseases such as SARS in East Asia and new forms of avian flu. Competitive pressures have led to increased recycling of waste products (such as bone meal), giving rise to the BSE crisis in the United Kingdom and elsewhere.

In contrast with the situation for food safety, international standards for agricultural health primarily and increasingly relate to processes and systems²⁴ rather than to product standards. Under the OIE there is a unified and broadly recognized set of codes and manuals containing standards, guidelines and recommendations that many countries seek to apply. For phytosanitary management, under the auspices of the IPPC, agreement has been reached over the past decade on a broad array of international standards and guidelines. Depending on national capacities, these are applied to varying degrees.

Also in contrast with the situation for food safety, where consumer concerns have catalyzed regulatory change, the driving force for many new or more stringent agricultural health standards has been domestic producer groups, seeking quarantine protection against pests and diseases (and in more than a few cases, market protection as well). However, there are some exceptions to this trend, especially in animal health, where links can exist between animal and human disease. The recent experience with Asian bird flu is one example, where poor reporting of the problem sharply undermined consumer confidence in poultry products and necessitated drastic remedies.

In recent years, national governments have notified the WTO regarding thousands of animal or plant health measures. These measures have involved a combination of generic approaches and restrictive or enabling measures vis-à-vis specific countries. Some of these measures have been challenged, either on a bilateral basis or through counter-notifications to the SPS Committee (see Chapter 3).

²⁴ In relation to animal health, the main measures affecting trade may include quarantine, import bans, vaccination, disease surveillance systems, development/maintenance of disease-free status, and introduction of traceability systems. For plant health, such measures include quarantine, pest risk analysis, surveillance, determination/maintenance of pest-free status, issuance of phytosanitary certificates, and the use of irradiation and other technologies as a phytosanitary measure.

Among the common trends in animal and plant health measures are the following:

Prominence of pre-approval arrangements based on pest- or disease-free status. Increasingly, industrial countries are moving toward pre-approval of potential international sources for live animals and certain meat products and plants/commodities. Approval in such circumstances is based on the prevailing disease status and incidence of pests in a given source area, and associated risk assessments. Hence, only a limited number of countries or (more recently) parts of countries are permitted to export beef and poultry to the United States, while pest risk assessments are needed before many horticultural crops can be approved for import. The U.S. Animal and Plant Health Inspection Service (APHIS) has a substantial backlog of requests from developing countries for risk assessments. For certain animal diseases (for example, FMD), the European Union has moved from requiring disease control measures to requiring disease *eradication* (meaning that a country must be disease free for at least a year without vaccination). This strongly limits the market access of developing countries, which often do not have the capacity to achieve full eradication without use of vaccination.

Increasing use of bilateral programs to govern agricultural health relations. The United States, Australia, and other industrialized countries are increasingly entering into memoranda of understanding with trading partners to define agricultural health risk mitigation measures. APHIS places personnel in many countries to oversee the pre-clearance of product consignments, thereby reducing the need for inspections at U.S. entry points. The European Union regularly inspects the production and processing facilities of its overseas suppliers. Such pre-inspection, together with the growing emphasis on approving pest-free areas, is geared toward expanding the phytosanitary frontier of the importing country. In contrast to a past pattern in which much of the attention and technical assistance provided by bilateral agencies was in a fire-fighting mode (see Chapter 6), there is an emerging tendency toward forward thinking and strategic planning in the design of such support.

Increasing requirements for oversight of the entire supply chain. Pressure toward oversight of the entire supply chain has come from growing requirements for traceability of beef within the European Union and Japan. Those requirements are likely to be extended to pork and poultry in the future. Another element is the demand for broader functionality on the part of competent authorities. Whereas the core functions of lead public agencies were once plant quarantine or disease control, industrialized country regulators are now demanding much broader competences from such agencies—including surveillance, local and international notification, contingency planning, risk assessment, export certification, oversight of accredited laboratories, and so on. Throughout the private sector, there is a general tightening of supply-chain oversight. For example, before the recent BSE outbreak, McDonalds prohibited mechanically recovered beef in its products and the use of meat and bone meal in livestock feed. Following the recent Avian flu outbreak, a leading Thai company has been the major force in regulating the poultry industry, moving toward closed (vertically integrated) systems acceptable under a recent OIE policy that designates disease-free status for certain areas or sub-sectors.

Intensified oversight and phasing out of certain veterinary drugs and plant/crop fumigants. Measures to phase out certain drugs and fumigants are driven by concerns about their potential to harm human health or the environment. The European Union is rapidly phasing out anti-microbial veterinary drugs (used as growth promoters), with increased rejections of products containing residues of such drugs. Other countries have restricted imports of livestock or meat products when other veterinary drugs have been used. The use of methyl bromide as a fumigant is now banned in the European Union and will be phased out elsewhere, as called for under the Montreal Protocol.

Growing attention to animal welfare. While animal welfare measures began through voluntary and private-labeling schemes, they are beginning to find their way into official regulations. Animal welfare is also a priority area under the current OIE Strategic Plan, with attention first given to transport and housing conditions. A broad array of NGOs has become active in this field, and pressures are being brought to bear on meat processing and other companies to address a range of issues. Thus, several supermarket chains in Europe have required their suppliers to adjust and document production practices affecting animal welfare.

2.6 Implications for Developing Countries

As described above, public and private standards of food safety and agricultural health have proliferated in recent years, and the rate of change in such standards has increased. There are significant differences in how standards are applied and enforced, as well as in the penalties for noncompliance. Thus, despite some commonalities in approaches, standards are becoming both more profuse and more diverse. Harmonization seems to be the exception rather than the rule. These circumstances raise challenges for developing country suppliers seeking to penetrate new markets or thrive in existing markets for high-value perishable agricultural and food products in industrialized countries.

- *Stakeholders face a major challenge in staying abreast of the rules and requirements pertaining to particular markets and supply chains and understanding how the game is actually played.* Suppliers are faced with layers of differing international standards, national standards, and private protocols. The more supply chains and countries that they service, the more complex the picture. Multiple sources of information—including official and company websites, direct contacts with regulating agencies and private buyers, databases maintained by industry associations, the experiences of one's competitors, and so on—need to be consulted to fully understand the operative rules of the game. At the same time, *exporters that are able to stay informed can derive significant competitive benefits.* Further, the enormity of the task of staying abreast of regulations and requirements can be reduced for all players through collective action, both within the private sector and through public-private partnerships.
- *There is a great need for developing country stakeholders to participate in standard-setting processes, even though food safety and agricultural health issues have become more technically complex.* Developing country representatives now enjoy greater

opportunities than previously to participate in the work of Codex, OIE, and IPPC. Some large and middle-income countries are taking advantage of those opportunities. But many critical standards are set in other arenas, and developing country representatives must raise their voice when external trading partners are deliberating regulatory changes and when private sector organizations are devising or revising their standards and conformity assessment procedures.

- It is necessary for developing country producers and agri-business entities (as well as administrators and policymakers) to consider effective safety and quality management as a core competence in competitiveness and to carefully consider the costs and benefits of standards compliance in their decisions about what to produce and which markets to target. Incumbent countries and suppliers have potentially significant “first mover” advantages over newcomers—in terms of company-level facilities and management systems, as well as official and industry-level systems (such as phytosanitary controls; pre-clearance arrangements, and so on). Incumbents are also better able to deal with new requirements in an incremental manner without becoming overwhelmed.
- Exporters and their governments must assume a strategic orientation in determining which markets to serve, which commodity systems to give priority to, and which commercial and political relationships to cultivate. There is now a greater need for a preemptive calculus of the risks that must be addressed, given the possibility of an SPS crisis. There is also a need to get ahead of the curve. A strategic approach also implies using public resources to facilitate rather than control or block and, perhaps, to target the allocation of resources to support potential winners within supply chains. This is both a controversial and complex arena for government activity. However, leaders can act as catalysts for wider efforts to enhance supply chain capacity and, through their learning processes, may reduce the risks for others in their efforts to upgrade.
- The competitive arena is becoming divided between preferred and other suppliers, with the former entering into multidimensional partnership arrangements with major retailers or their category managers, and the latter relegated to conducting their trade on a transactional basis in more volatile or less dynamic markets. Attaining and maintaining the status of preferred supplier normally requires considerable investment—in facilities, human capital, and management systems—which is likely to represent a significant barrier to many developing country firms. Garcia Martinez and Poole (forthcoming) refer to this investment requirement as a ‘commercial barrier to trade’. However, the potential benefits from achieving a preferred status are significant, especially as buyers in industrialized countries shift toward longer-term relations with their suppliers. This suggests high costs but also high benefits.
- Given the diversity of standards applied within and between countries, there is scope for different speeds on the highway of standards compliance. In most instances, developing country suppliers do not face an all or nothing choice when determining the investments or other changes they must make to conform to emerging standards in

target markets. Markets remain where food safety and agricultural health requirements are less onerous than elsewhere and that offer market opportunities for countries with lower levels of capacity to meet sophisticated standards. Inevitably, choices have to be made regarding which of these markets can be targeted most profitably. In many cases, there may be large and profitable opportunities to service one's domestic market or other regional or developing country markets without having to invest immediately in quality and safety assurance systems or other specialized facilities required for access to the strictest markets.

- *The likelihood is growing that exports may be denied entry to markets at the border*—a trend fueled by a combination of increased availability of agency resources and heightened concern for bio-security and for protection against prominent food safety threats. Already in recent years there has been a large increase in the number of border interceptions, both in the United States and the European Union.²⁵ The impact of the rising propensity to intercept will depend on whether increased rejections translate into automatic detention, exporter pre-approval, or other schemes by the major importing countries. Further, effective export inspection and monitoring of border detentions by exporting country governments and individual exporters can reduce the risks and, potentially, be a further source of competitive advantage.

The nature of the standards environment raises important issues and challenges for the World Bank in its operations related to agricultural and rural development and trade facilitation. Although current developments in food safety and agricultural health pose daunting challenges for developing countries, it will be evident from the findings presented in the next chapter that many countries have been able to upgrade their capacities when needed and have benefited as a result. The role of the Bank should be to encourage positive responses and appropriate forms of capacity-building so as to help developing countries to turn the challenges of new standards to their advantage. To do this, the Bank will have to monitor these developments, remain informed of emerging challenges, and develop an improved understanding of the link between trade-related SPS management and broader challenges of national capacity-building.

Industrialized countries should include in their SPS regulatory assessments the prospective impact of proposed measures on developing countries (in terms of market access and competitiveness) and consider alternative measures, including technical assistance, to mitigate adverse effects. Intensified efforts should be made to inform policymakers and technical counterparts in developing countries about upcoming regulatory changes that may affect their exports. And, whether through memoranda of understanding, twinning arrangements, or other programs, industrialized countries should work more closely with their developing country trading partners to achieve mutual recognition of quality assurance and SPS management systems.

²⁵ It is difficult to ascribe the increased rejections to protectionist commercial interests. Most of the rejections relate to products for which there is either no direct competition domestically or where imports—from various countries—dominate domestic supplies.

CHAPTER 3

STRATEGIES FOR COMPLIANCE WITH INTERNATIONAL AGRI-FOOD STANDARDS

3.1 Standards as a Strategic Issue

The changing and increasingly complex regulatory and commercial environment highlighted in Chapter 2 poses significant challenges—and opportunities—for developing countries, especially for stakeholders involved in export-oriented agricultural and food production, processing and trade. The prior analysis suggests that both policymakers and the private sector need to adopt a strategic perspective on standards, identifying the emerging set of requirements and opportunities, weighing the available options to address them, and effectively managing the chosen processes of adjustment.²⁶ This notion of *strategic options* is unconventional in the context of developing countries and the impacts of sanitary and phytosanitary measures on trade. The more typical assumptions is that developing countries are ‘standards takers’, facing all-or-nothing decisions about compliance with little or no room for accommodation. But developing countries frequently do have room for maneuver, as will be demonstrated in this chapter.

3.2 Responding to Standards: Immediate and Broader Development Objectives

What objectives are private entities and policy makers pursuing when responding to the increasingly complex environment of food safety and agricultural health standards? Put another way, what criteria can be used to define the success or failure of their responses? In the context of export agriculture, the following parameters are important:

- *Market access.* The most obvious measure of the success of efforts to comply with evolving standards is the level of access to existing or new markets for agricultural and food products. This might include the value or volume of trade over time compared to some benchmark. In the case of existing markets, the benchmark might be the level of exports before imposition of the standard or, more rigorously, the estimated level of exports that would have occurred in the absence of the standard. In the case of a new market, the benchmark could be considered zero, when the market was previously closed entirely, or else success could be measured by whether the export volume, value or market share came to exceed a comparable level when there was some past history of trade.
- *Benefits exceeding costs.* To be considered successful, compliance measures should generate benefits that clearly exceed the associated costs—direct and indirect, recurring and nonrecurring. Both nonrecurring and recurring costs should be

²⁶ For the private sector, the strategies vis-à-vis standards compliance should form part of a wider commercial orientation which determines the most appropriate products, markets, and technologies to adopt. For policymakers, potential investments in standards-related physical and administrative capacity should be weighed in relation to other public expenditure priorities.

compared with the expected flow of benefits over some defined period in terms of the economic value of exports, spillover effects, and so on. Cost-effectiveness might be used as an alternative metric, whereby differing approaches to maintaining or achieving market access are compared against the value of a defined unit of exports. This cost-benefit calculus may vary among different private stakeholders and between these and policymakers, depending on which costs and benefits are considered relevant to their own decision making (see Chapter 4). For preemptive measures that succeed by sparing the country, industry, or firm the costs of an SPS crisis, imputed benefits will largely be defined by opportunity costs.

- *Long-term competitiveness.* Aside from short- and medium-term impacts on market access, it is important to recognize the effects of compliance efforts on the long-term competitiveness of an industry and its different participants. A strategic perspective on standards would suggest that this is the most appropriate metric to use. Thus, compliance efforts should be judged in terms of the extent to which compliance enhances competitiveness, on a sustainable basis, in the context of prevailing competitive forces and trends. Competitiveness may be measured by changes in absolute levels of exports to a given target market, changes in market share, or changes in unit values relative to direct substitutes from other sources.
- *Social inclusion/exclusion.* Responses to new standards may result in changes to the structure and operating modes of supply chains (see Chapter 5), affecting the participation of different groups. Of particular concern is the impact on vulnerable groups--such as smallholder farmers, micro/small enterprises, and farm and firm workers-- especially those that have become dependent on export-oriented supply chains and may have limited alternative income-earning opportunities. It may be an important policy objective to mitigate the adverse effects of certain measures on vulnerable groups and enhance their capacity to remain active and competitive in a more demanding supply chain.
- *Spillover effects.* Efforts to comply with agri-food standards in external markets can have both positive and negative spillovers for domestic consumers and producers. These may include impacts on food safety, agricultural productivity, worker safety, and rural livelihoods. Although rarely considered, the existence of such social and economic spillovers can have a significant impact on the balance of costs and benefits associated with capacity-building and compliance efforts.

These points suggest that standards for agricultural and food products need to be considered from a wider strategic perspective encompassing many elements of development. Compliance decisions can have wide-ranging implications not only for market access and the efficiency of resource use, but also for the livelihood of vulnerable social groups and for wider processes of economic and social change.

It is also evident that there may be tradeoffs among the above objectives. Certain approaches may result in a rapid resumption of market access yet entail considerable costs and exclude many producers and firms. In making strategic decisions about

compliance with new standards, choices have to be made about the relative importance of these parameters and tradeoffs between them. Where the cost of maintaining or gaining access to a particular external market likely exceeds the potential benefits, alternative commercial strategies should be carefully considered. The temporal dimension is important as well: It is important to consider not only immediate trade flows but long-range competitiveness and prospects for social change.²⁷

This strategic approach to standards in international trade is distinct from short-term “fire fighting” in response to immediate problems. Immediate problem-solving is inevitable in certain contexts, for example where a new food safety risk emerges that threatens market access, or when there is an outbreak of a particular animal disease. Yet, many developing countries have no strategic framework at all for SPS management and merely seek to cope with or react to emerging events. Ideally, standards-related compliance should be incorporated into broader policymaking and capacity-building decisions related to competitiveness in international markets. Efforts to respond to standards should be proactive—they should look ahead to how requirements are likely to change in the future and incorporate responses in long-term development efforts.²⁸

3.3 Strategic Options: Exit, Voice, and Compliance

Table 3.1 presents a simple conceptual framework to characterize alternative strategic response to standards. This scheme draws on the concepts of exit, loyalty, and voice developed by Hirschman (1970).²⁹ In this case, however, we use the term *compliance* rather than *loyalty*. The pro-activity-reactivity dimension relates to the time when efforts to comply commence. This framework can be employed to assess the impact of capacity-building efforts; as *capacity-building can be seen as an attempt to maximize the strategic options available to both government and the private sector in developing countries when faced with new standards and, more particularly, the ability to employ strategies that generate gains in competitiveness and wider economic and social outcomes.*

²⁷ A common view is that the compliance process should be stretched out over time so as to facilitate restructuring and minimize or delay negative impacts on vulnerable groups. Delays in compliance, however, can be more detrimental than early compliance to the very groups that policymakers are trying to protect. Because many actors, especially the most vulnerable, may have problems moving quickly because of limited access to expertise and capital, and institutional inertia, the most appropriate strategy may be to stagger compliance with clearly defined deadlines and to develop system-wide capacity that enhances stakeholder abilities to respond to standards, as and when they arise.

²⁸ This perspective contrasts with the approaches of many donors to standards and trade-related assistance, which are typified by efforts to solve problems as and when they arise (see Chapter 6). Many developing countries share that perspective, focusing on *coping strategies*. From this perspective, decisions are limited to micro details, for example, which type of testing apparatus to install in a laboratory.

²⁹ Hirschman’s framework was used to examine economic and political behavior as responses to the decline of firms, organizations, and states. Depending upon the context, exit could involve leaving an organization, emigrating, or ceasing to buy a company’s products. Voice involves protest, lobbying for changes in rules and laws. For Hirschman, loyalty involves deepening one’s participation in and alignment with an entity’s goals and processes.

TABLE 3.1 STRATEGIC RESPONSES TO STANDARDS

	Reactive	Proactive
Exit	Wait for standards and give up	Anticipate standards and leave particular markets
Compliance	Wait for standards and then comply	Anticipate standards and comply ahead of time
Voice	Complain when standards are applied	Participate in standard creation or negotiate before standards are applied

In many dialogues on standards, especially relating to developing countries, the implicit single strategic option is *compliance*. Countries (or, more accurately, suppliers) are expected to comply with the standards being implemented by government or the private sector in major export markets. The effort to comply can be made at the time a standard comes into force (that is, reactively), or ahead of time (proactively), according to predictions about how standards are likely to evolve in the future. All else being equal, a proactive approach affords greater potential to manage compliance in a manner that brings about strategic gain and minimizes detrimental economic and social spillovers. A proactive approach may afford the opportunity to choose among a variety of different technologies and organizational/administrative means to achieve the needed outcomes. Those acting early may also achieve so-called “first mover” advantages—for example with respect to earlier sunk costs and reputation effects, as well as the greater flexibility afforded by longer periods over which compliance can be pursued.

Depending on circumstances, various steps may be taken in pursuit of compliance. As the case study examples below will illustrate, they may include the following:

- Legal and regulatory change
- Reform of institutional structures and responsibilities
- Restructuring supply chains and increasing control over primary production
- Modifications in production, post-harvest, processing, and treatment technologies
- Modifications in firm- and farm-level quality assurance and safety management systems
- Strengthening of information and surveillance systems
- Technical and scientific research
- Investments in physical infrastructure
- Strengthening of accreditation and certification systems.

The strategic options open to developing countries are not limited to compliance. Countries or individual private sector exporters can *exit*, choosing not to comply with the standards being imposed in a particular market. This implies switching customers, in the case of a private standard—or exiting export markets altogether. The firm or farmer may choose to switch to different products for which the needed risk-management measures are less problematic or costly. Such a strategy may be employed if compliance would

yield a fundamental loss of competitiveness or very negative economic and social impacts, if resources could be better spent elsewhere, or if there are profitable alternative markets that have less demanding standards. Exit should not be construed as a ‘loser’s’ strategy. Shifting product lines or market orientation may be a very prudent strategy to maintain competitiveness.

Developing country governments and exporters can also adopt a strategy of *voice*—to attempt to change the prevailing rules or respond to new standards by negotiating or protesting. For example, WTO members may raise complaints through a cross-notification in the SPS Committee (see below) or engage in bilateral negotiations with their trading partners about the specific actions required to achieve compliance. Individual exporters may question the requirements being imposed by their customers and attempt to come to a compromise that reflects their own circumstances and their customers’ demands.³⁰

In addition to the two dimensions of Table 3.1, there are other ways to characterize the responses of developing countries to new standards for agricultural and food products in international markets. One is to distinguish between *defensive* and *offensive* approaches. Defensive strategies are those aimed at maintaining the status quo and minimizing the impact of change. Those taking this approach are typically seeking to scale back the actions (and often also the investment) needed to achieve compliance. Defensive approaches are often pursued under conditions of resource limitation and risk adversity. Offensive strategies involve attempts to use standards to gain competitive advantage, even where this may require additional investment beyond the minimum required to achieve compliance.

A final dimension relates to the *locus* of efforts to achieve compliance or exercise voice. Measures can be taken in the public or private sectors, involving either individual entities (for example single firms, farms, or agencies), or through various forms of collective action (Table 3.2). Where both the public and private sectors are adopting measures, the leadership or driving force behind the process may come from either side.

TABLE 3.2 ACTORS IN STRATEGIC RESPONSE TO STANDARDS

	Individual	Collective
Public	Specific ministry or agency	Inter-ministerial task forces Government to government memoranda of understanding Multi-country SPS counter-notification
Public-private	Subsidies, co-financing Joint ventures	Joint public-private sector task forces
Private	Firm and farm investments Company codes of practice	Trade and industry associations Grower associations Partnerships in coordinated supply chains

³⁰ In reality, it is likely that these strategic options are not entirely separable and that countries and exporters might adopt mixed strategic responses to emerging standards. In particular, voice is likely to be adopted alongside compliance and even exit. Indeed, it is unlikely that voice alone would form the sole basis of a strategic response to emerging standards.

Traditionally, relatively clear distinctions were made between aspects of SPS management that lay in the domain of the public sector (for example, regulation and laboratory testing capacity) and those that belonged to the private sector (for example, better hygiene controls in processing facilities). Increasingly, however, these boundaries are being challenged. For example, the potential role of self-regulation through industry-level codes of practice and of commercial laboratories for product certification is being recognized.³¹

Further, there is recognition of the potential efficiencies associated with collective and collaborative actions. These can include inter-ministerial task forces seeking to avoid duplication of efforts where multiple tiers of government are involved and trade and industry associations that build on the compliance investments of individual enterprises. Collective action also can take place across the public and private sectors, for example, through joint task forces. More broadly, it is recognized that both the public and private sectors have a role to play in responding to new standards and that national standards capacity should be viewed from this perspective.³²

In the context of this framework, *the most positive and potentially advantageous strategy combines voice, proactivity, and an offensive orientation*. Everything else being equal, this approach is most likely to turn the challenges associated with new standards into a competitive opportunity and to yield positive social and economic spillovers.³³ Capacity-building should strive to maximize the strategic options for developing countries and, more particularly, to enhance their ability to implement strategies that are offensive, proactive and involve negotiation.

Many countries (and exporters) are not in a position to be “first movers”—anticipating emerging standards and taking early action to gain competitive advantage through compliance and differentiation. Relatively small or weaker countries, industries, or firms

³¹ In relation to food quality assurance and SPS management, relatively few functions can be considered pure public goods. Examples include the maintenance of pest- and disease-free zones, border inspection and quarantine for plant and animal diseases, and epidemiological surveillance. These generally need to be carried out or coordinated by the public sector. Yet, a broader set of market failures may arise in relation to quality, food safety, or agricultural health because of inadequate or asymmetrically distributed information, the existence of externalities, or the presence of economies of scale. To overcome these market failures, periodic or sustained public interventions may be needed. In some cases, direct public investment in facilities or services would be an appropriate response. Yet other types of interventions—including education, information, regulation, or more direct facilitation of private actions—may be more suitable and effective. There are many institutional models for managing quality and SPS hazards, the suitability of which will vary among countries depending on their legal and administrative structure, and level of commercial development, geography, prevailing education levels, and so on.

³² The lack of effective coordination of SPS strategy development and implementation—in government, in the private sector, and especially between government and the private sector—is a common problem among developing countries, compounding the challenges associated with standards compliance and weakening the potential to exercise influential voice on a bilateral or international level.

³³ Conversely, the most negative approach (which one can hardly call a strategy) is a combination of exit, reactivity, and defensiveness. Indeed, there may be considerable costs associated with such an approach if it means sacrificing public and private investments made to enter the market that has been lost, as well as the social and economic consequences of the disintegration of supply chains oriented toward export markets.

may lack the requisite contacts, information, experience, or financial resources to be “first movers.” But should second movers aim to mimic first-mover strategies, along the lines discussed above, or would other responses be more advantageous?

Second movers can certainly learn from the successes and mistakes of the first movers, adapting or modifying their practices to suit their own circumstances and offsetting the risks and costs incurred. Second movers also can ride on the coattails of others in the realm of voice, playing a supportive (but less costly) role in pertinent complaints to the WTO’s SPS Committee or vis-à-vis particular trading partners. Second movers need not be passive or defensive. They should still strive to be proactive in developing and implementing trade-related SPS management strategies. The resource constraints that they face make it even more imperative that clear priorities be set and collaborative actions pursued.

3.4 Evidence on the Strategic Approaches Adopted by Developing Countries

The literature analyzed and the research done for this report provide some evidence of the strategic approaches used by the private sector and governments in developing countries when faced with new standards for agricultural and food products in international markets. The evidence from preexisting literature and data mainly shows how developing countries have responded to evolving food safety and agricultural health standards at the international level—through the WTO and participation in international standard-setting organizations. Each of these avenues will be briefly discussed. Subsequently, various experiences from our own case studies will be examined.

3.4.1 International ‘Voice’

The number and nature of complaints and counter-notifications made through the SPS Committee of the WTO is a good indicator of the degree to which developing countries are able to make their voice heard when new standards are proposed by trading partners. Admittedly this is a rather reactive mode of voice, yet our analysis is constrained by the lack of data on other responses, such as bilateral complaints and negotiations. Developing countries have made frequent use of the formal review and complaint processes of the SPS Committee since its inception in 1995 to register their concerns with respect to a significant number of notified measures, both by industrialized and other developing countries. Table 3.3, an updated version of information provided in Roberts (2004), summarizes the pattern of counter-notifications by regulatory goal and the country group raising the issue or being the target of a complaint.

**TABLE 3.3 COUNTER-NOTIFICATIONS RELATING TO NEW MEASURES
IN THE SPS COMMITTEE, 1995–2003**

Complaints against measures of	Regulatory goal of contested measure				
	Plant health	Animal health	Human health	Other*	Total
Number of complaints by developed countries					
Developed countries	18	11	49	3	81
Developing countries	19	15	41	4	79
Multiple countries	—	2	1	—	3
<i>Subtotal</i>	37	28	91	7	163
Number of complaints by developing countries					
Developed countries	14	14	38	2	68
Developing countries	8	19	7	2	36
Multiple countries	1	2	—	—	3
<i>Subtotal</i>	23	35	45	4	107
Total	60	63	136	11	270

Note: Includes complaints about horizontal regulations (such as those regulating products of modern biotechnology) that reference human, animal, and plant health as objectives.

Source: Roberts (2004), updated with results from 2003.

A more detailed look at the individual complaints yields a more complex picture. Complaints by developing countries are dominated by a handful of emerging economies. Either Argentina, Brazil, Chile, or Thailand has been involved in the great majority of complaints by developing countries. Each has issued or supported more than a dozen complaints, with Argentina alone being involved in more than a quarter of all developing country complaints. Only a handful of other countries, including Uruguay, Philippines, South Africa, Ecuador, and India, have been involved in multiple cases. The pattern of participation seems to reflect the prominence of certain countries in the trade of a few product categories, especially beef and horticultural products, rather than the overall structure of developing country agricultural and food trade.³⁴

Low-income countries are weakly represented in the pool of counter-notifications, issuing or supporting complaints in only five cases. While this could partly be a reflection of the structure of their exports, which are concentrated in commodities for which food safety and agricultural health measures are of lesser importance, it likely also reflects their limited capacity to participate in the SPS Committee. It is unlikely to be the case that their lack of formal complaints signifies that they have been very successful in resolving their concerns through bilateral negotiations.

³⁴ A large proportion of the counter-notifications for animal health measures have highlighted inconsistencies between national and international (such as OIE) standards for FMD controls (for beef and pork) and those related to BSE (especially for meat by-products). Many of the counter-notifications pertaining to plant health point to the absence of proper risk assessments in relation to pests and diseases afflicting horticultural crops. For food safety, the majority of counter-notifications point to the absence or weaknesses of scientific evidence for the proposed measures.

Some interesting patterns can be observed from Table 3.3. First, in relation to plant and animal health, developing countries have issued almost as many complaints against their peers as against developed countries. The majority of the former involve complaints against neighboring countries or others in the same region, suggesting weaknesses of some regional organizations to harmonize standards or otherwise resolve standards-related disputes. Argentina has complained against 12 developing countries, including 9 in Latin America, primarily in relation to measures to control against FMD. Second, the vast majority of developing country counter-notifications for food safety measures are against developed countries. The European Union alone is the subject of two-thirds of these complaints.³⁵

The growing number of recorded complaints or counter-notifications by developing countries, however, provides only a crude indicator of the extent to which they are able and willing to exhibit voice. These complaints probably represent the tip of the iceberg, with a greater proportion of concerns and disputes being raised bilaterally. At the same time, however, it could also indicate that developing countries in general (and the least developed countries in particular) lack the capacity to complain or negotiate when new standards are applied. Further, the apparatus of formal complaints through the WTO relates only to mandatory standards set by public agencies. As noted in Chapter 2, a growing array of standards are being set privately, either through consensus within particular industries or by the gatekeepers of the dominant supply chains. While many such standards are ostensibly voluntary, they are becoming the *de facto* standards for trade. Compliance is required to gain or maintain access to particular buyers or market segments. Voice relating to such standards will manifest itself through private bilateral negotiations between supplier and customer—unobserved by outsiders.

The ultimate form of voice a developing country can exert through the WTO is to pursue a complaint through the WTO Dispute Settlement Body (DSB). Initially, a member requests a formal consultation in an attempt to rectify the problem. To date, of the 28 requests for consultations submitted in relation to SPS measures, seven have been made by developing countries—the Philippines, India, Ecuador, Thailand, Argentina and Nicaragua. Only two of the consultations requested by developing countries have proceeded to the establishment of a dispute settlement panel; these involve the Philippines (against Australia) and Argentina (against the European Union). Largely, this reflects the very significant cost of pursuing a complaint, which is likely to extend to an appeal. Although a mechanism has been put in place to reduce these costs (Box 3.1), the benefits from such a strategy promise to remain both limited and uncertain. Indeed, bilateral negotiations with trading partners are likely to be more fruitful.

³⁵ There are several reasons for this. First, the process of harmonization has often resulted in the adoption of the most stringent standards previously applied by individual member states. Second, the European Union has frequently embraced the precautionary principle when adopting standards in the context of scientific uncertainty. Third, the complex administrative structure of the European Community makes it difficult for countries to resolve differences with member states through bilateral discussions.

BOX 3.1 TECHNICAL ASSISTANCE AND REDUCING THE COSTS OF VOICE: THE ROLE OF THE ACWL

The Advisory Centre on WTO Law (ACWL) is a public international organization independent of the WTO. It was established in 2001 to provide legal advice on WTO law and support in WTO dispute settlement proceedings. WTO member countries (or countries in the process of joining) that are designated by the United Nations as “least developed” may use the services of the ACWL without belonging to the center as members. Other developing countries can join as members. Member countries are classified according to their share of world trade, with an upward correction reflecting their per capita income. This classification determines their contribution to the Endowment Fund and the rate of fees payable for services rendered by the ACWL.^a

In its short existence, the ACWL has provided legal advice to developing countries in more than 30 cases. In some cases, this advice has been given in the context of informal dialogues or bilateral consultations. Sound legal advice, including determining whether a measure could be inconsistent with WTO rules, may provide incentives for the other party to reach a mutually satisfactory result and thus spare the developing country the time and cost of pursuing more formal dispute settlement. Thus far, the ACWL has provided advice in two SPS-related cases that went as far as a dispute settlement panel. In both cases, the ACWL represented the Philippines against Australia.

A private lawyer specializing in trade disputes may charge \$350 to 400 per hour. ACWL’s fees are on a sliding scale, with least developed countries (LDCs) paying the equivalent of \$32/hour and many other low-income countries paying \$130/hour. Cases involving technical or sanitary standards are considered by the ACWL as generally being of “high complexity,” requiring application of technical expertise and scientific evidence. The level of advisory effort in such cases may go as high as 127 hours for bilateral consultations, or 411 hours where dispute settlement panels are involved. A further 168 hours is typically involved should the case go to an appellate body.

Hence, for an LDC, the maximum fee that the ACWL would charge for a consultation would be \$4,064. Should the case be referred to a panel, the additional cost could go as high as \$13,152, whereas a case that subsequently went to an appellate body could involve an additional \$5,376. Thus, if the dispute went through the full cycle the total charge would be \$22,592 for an LDC—a very modest cost for high-quality legal advice, provided the dispute is of some economic importance to the country. The fee structures for other developing and transition countries are somewhat higher. Depending on the country, the maximum fees for the ACWL to advise in a bilateral consultation process would be between \$16,500 and \$33,000.

The ACWL is a new, yet important unit that answers the needs of many members. The organization facilitates the use of the rules of the WTO in the favor of poorer members. It provides legal aid at affordable fees for poor countries, and, in so doing, increases their voice and legal bargaining position.

a) The countries are divided as follows: Category A—Hong Kong and China. Category B—Colombia, Egypt, India, Mauritius, Oman, Pakistan, Philippines, Thailand, Turkey, Uruguay, and Venezuela. Category C—Dominican Republic, Ecuador, Guatemala, Honduras, Kenya, Latvia, Nicaragua, Panama, Paraguay, Peru, Jordan, and Tunisia.

Data are available on developing country participation in international standards-setting organizations in the area of food safety and agricultural health, notably the Codex Alimentarius Commission (Codex), Office International des Epizooties (OIE), and the International Plant Protection Convention (IPPC). These data provide some evidence of the degree to which developing countries are able to exhibit voice at the international level through participation in the development of international standards. Around 80 percent of developing countries are members of Codex and the OIE, but only 55 percent are signatories to the IPPC (Henson and others, 2001). Their participation in the main decision-making bodies of these organizations is generally very limited. The Codex commission meets once every two years in Rome or Geneva. In 2001, about 49 percent

of developing country members participated. In the IPPC, the main decision-making body is the Interim Commission on Phytosanitary Measures (ICPM), which meets annually in Rome. In 2001, just 41 percent of developing country contracting parties participated. The International Committee of the OIE, which meets annually in Paris, typically has much higher levels of participation by developing country members. In 2001, around 80 percent participated.

Regular participation by developing countries in Codex is typically limited to a group of large or middle-income countries including Argentina, Brazil, Chile, China, India, Malaysia, Mexico, South Africa, and Thailand. Although some other countries, such as Egypt and Kenya, have made efforts to enhance their participation, most developing countries attend meetings irregularly at best. Further, although the biannual Commission meeting is the forum in which standards are approved, standards are actually developed in committees that generally meet on an annual basis. Developing country participation in these meetings is typically very low, suggesting that, even when developing countries participate in international standard-setting organizations, they do so in a reactive mode.

It is evident that many developing countries face considerable constraints that limit their participation in both the SPS Committee and international standard-setting organizations. That limited participation, in turn, limits their international voice. In many cases the necessary resources are not available to attend multiple meetings each year, most of which are in industrialized countries. In the case of the WTO, a number of smaller countries do not have permanent missions in Geneva. Further, even when attendance at meetings is possible, many countries lack the technical know-how and experience to use these forums to address their needs. For example, they may not be able to assemble the dossier of scientific evidence required to counter the positions of the major industrialized countries.

3.4.2 National Compliance Strategies

Concrete and in-depth evidence of strategic approaches adopted by developing countries to comply with standards for agricultural and food products in international trade is provided by the case studies carried out in the World Bank research program, and by some previously published studies. This section examines three commodity sectors in turn, looking across the country cases to compare and contrast the strategies that have been employed.

Fish and fishery products

The case studies examined the fish and fishery products sectors of India (Kerala State), Kenya, Nicaragua, Senegal, and Thailand. Although these countries differed in the products they exported (shrimp from Kerala, Nicaragua, and Thailand; fin fish from Kenya and Senegal) and in the destination of their exports, they do allow for comparison of strategic approaches to compliance with evolving food safety standards, most notably related to hygiene in fish processing and controls on antibiotics in aquaculture production. Some of these countries have faced export bans and other food safety problems. All have faced demands for enhanced food safety controls throughout the

supply chain. The supply chains under scrutiny were generally operating below capacity; the standards used in their processing facilities differed markedly. All were facing growing competition and price pressure that challenged their market position.

The dominant approach of the five study countries has been reactive, compliant, and defensive—both in government and the private sector (Table 3.4). Thus, hygiene and antibiotic controls have been upgraded largely in response to regulatory change in the European Union and United States, or upon demand from major customers. In Kenya and Senegal, little action was taken until the European Commission sent inspectors, which in Kenya's case led to restrictions on sales to the European Union. In Kerala, the Indian government had undertaken some initial reforms of its regulatory framework, yet these were insufficient to comply with the European Union's requirements. In these three cases the substantive drive to upgrade hygiene controls occurred suddenly (Box 3.2).

Across all of the countries there were examples of exporters who adopted proactive and offensive strategies; these firms had seen the overall direction of food safety standards and made substantive efforts to upgrade their controls to meet those standards ahead of their competitors. While in most cases they represented a relatively small part of the total industry, they clearly stuck out as leaders. At the same time, however, some processor/exporters exited the industry altogether in response to stricter controls, while others refocused their business on other markets with lower standards. Standards-related pressures were not the only reasons to exit. Other factors, including resource management and broader competitive and capacity pressures, compounded the problem of generating the investments needed to comply with the new standards (Box 3.3).

The cases of India, Kenya, and Thailand showed some attempts to exert voice, although in a reactive and defensive mode in response to restrictions already imposed or threatened by the European Union. Both the government and industry were involved in such efforts, which clearly were designed to 'fight fires'. While ongoing negotiations may have taken place between individual exporters and their customers, none of the exporters interviewed alluded to these, which implies that they were not a major element of strategic responses to evolving standards.

While the five case study countries differed significantly in size and income, their response to evolving food safety standards was broadly similar; most responses were compliant, reactive, and defensive. There was very limited evidence of voice; where it was used, it was generally in crisis mode, in response to impending or prevailing restrictions. But some exporters—clearly market leaders—had seen the drive toward higher standards and made advance efforts to comply. They gained market share as a result of their efforts. Finally, the imposition of standards and the impacts on the structure and *modus operandi* of the export supply chain reflected prevailing market conditions and economic and competitive pressures. This suggests that some of the changes observed in the case studies, in particular the decisions by some firms to exit the market, were attributable in part to other factors.

**TABLE 3.4 ANALYSIS OF STRATEGIC APPROACHES TO
COMPLIANCE WITH FOOD SAFETY STANDARDS FOR FISH AND FISHERY PRODUCTS**

	Reactive	Proactive
India (Kerala)		
Exit	<ul style="list-style-type: none"> Some processors have ceased production since imposition of higher hygiene standards. 	
Compliance	<ul style="list-style-type: none"> Substantive efforts to comply with hygiene requirements occurred after inspection mission by European Commission. 	<ul style="list-style-type: none"> Some initial attempts to reform regulatory controls prior to European Commission inspections Some processors had seen drive toward higher hygiene standards and built/upgraded their plants (offensive).
Voice	<ul style="list-style-type: none"> Complaints to European Commission and member states over border detentions caused by antibiotic residues/bacterial inhibitors. 	
Kenya		
Exit	<ul style="list-style-type: none"> Some processors have ceased production since imposition of higher hygiene standards 	
Compliance	<ul style="list-style-type: none"> Virtually all efforts to comply with hygiene requirements occurred after inspection mission by European Commission. 	
Voice	<ul style="list-style-type: none"> Joint government-industry mission to European Commission once restrictions imposed 	
Senegal		
Exit	<ul style="list-style-type: none"> Some processors have ceased production since imposition of higher hygiene standards. 	
Compliance	<ul style="list-style-type: none"> Substantive efforts to comply with hygiene requirements occurred after inspection mission by European Commission and were induced by donor assistance. 	<ul style="list-style-type: none"> Some processors had seen drive toward higher hygiene standards and built/upgraded their plants (offensive).
Thailand		
Exit	<ul style="list-style-type: none"> Some processors have ceased production since imposition of higher hygiene standards. 	
Compliance	<ul style="list-style-type: none"> Substantive efforts to implement controls on antibiotics occurred after restrictions imposed by European Union. Most processors upgraded their hygiene standards in response to regulatory changes in the United States and European Union, or upon demands from major customers. Substantive upgrades of government laboratories came in response to EU requirements. 	<ul style="list-style-type: none"> Some initial attempts to reform regulatory controls prior to European Commission inspections Some processors had seen drive toward higher hygiene standards and built/upgraded their plants (offensive). Attempts to implement good aquaculture practice before problems with antibiotic residues occurred (offensive)
Voice	<ul style="list-style-type: none"> Joint government-industry mission to European Commission once restrictions were imposed over antibiotic residues 	
Nicaragua		
Exit	<ul style="list-style-type: none"> One processor ceased production after imposition of higher hygiene standards, along with other factors 	
Compliance	<ul style="list-style-type: none"> Substantive efforts to upgrade controls came after regulatory change in United States Most processors upgraded their hygiene standards in response to regulatory changes in the United States, reflected in demands from major customers. 	<ul style="list-style-type: none"> Some processors had seen drive toward higher hygiene standards and built/upgraded their plants accordingly (offensive).

Source: Background Case Studies

BOX 3.2 REGULATORY CHANGES AND PRIVATE SECTOR STRATEGIES IN INDIA—FISH AND FISHERY PRODUCTS

India has faced many challenges in meeting hygiene requirements for fish and fishery products in its major export markets. Although the processing sector expanded rapidly in the 1990s, local hygiene controls did not keep pace with emerging requirements abroad. Some new facilities had high standards of hygiene, yet many existing facilities needed upgrading. Even some new plants were not compliant with EU requirements. Inspections by the European Commission in April 1997 identified significant shortcomings. Even earlier, the Commission had voiced skepticism that the large number of plants included on the list of facilities approved by the Indian authorities could actually meet EU requirements. Following inspections, the European Commission banned imports of fresh crustaceans and cephalopods and imposed border testing for frozen products. Subsequently, all exports of fish and fishery products from India to the European Union were banned in August 1997.

Between August and November of 1997, the Indian government made great efforts to reform its food safety controls and achieve compliance with EU requirements. Thus, when the European Commission undertook further inspections in November 1997, it considered the controls that were in place to be equivalent to EU legislation. The ban on exports was lifted in December 1997. The Indian government improved hygiene through the imposition of draconian measures, requiring, for example, that all preprocessing operations be integrated into processing facilities and imposing strict limits on approved output according to plants' capacities for water, ice-making, and effluent treatment. Processing facilities experiencing a border detention in the European Union would automatically be subjected to closer scrutiny.

Alongside such regulatory measures, the Marine Products Export Development Authority (MPEDA) has implemented programs to support improvements in hygienic controls and other food safety practices in fish processing. These include subsidy programs for upgrading processing facilities and training managers and workers through the supply chain. Many enterprises made significant investments to upgrade their processing facilities and implement stricter hygiene controls. Some plants did this proactively, anticipating the need to operate to stricter hygiene standards and building such considerations into the design and operation of new or upgraded facilities. Others waited until the national government required them to improve their operations. Some that were unable to fund the required investment either exited the sector or relied on working capital, compromising their ability to source raw materials.

It is widely recognized in the fish processing sector that, for smaller exporters, two or three rejections can doom a company. So many processors have made efforts to spread their risks by diversifying their market base between the European Union, United States, and Japan. Some have diverted sales to less challenging markets such as China, the Middle East, and Singapore. Others have attempted to diversify their business or relied on other activities. For example, a number of the larger fish processors also operate in the hotel, travel, shipping, and construction sectors, as well as other food product sectors.

Although compliance with enhanced food safety requirements has imposed a burden on fish processors, some major players in the sector have gained. In particular, processors that already had high standards of hygiene or that made improvements earlier benefited from premium prices and lower competition for raw product while the number of EU-approved facilities was still limited. These "first movers" were able to repay their debts at an earlier stage and offset them against greater returns. Very few of the facilities that delayed compliance are performing well; most are struggling to repay loans while operating under conditions of lower margins and struggling to pull together the working capital to source raw material.

Fish processors have acted collectively through the Seafood Exporters Association of India (SEAI). The SEAI has been instrumental in a model infrastructure project that will link preprocessing units to common water, ice, and effluent facilities. The facility includes modern laboratory facilities that will have the capacity to perform the full range of microbial and chemical tests required by exporters. The SEAI has also proposed an export cluster—featuring new landing facilities, water and ice supply, and effluent treatment—in order to improve hygiene in the shore landing of fish.

Source: Henson and others (forthcoming)

BOX 3.3 CAPACITY ISSUES IN KENYA'S FISH PROCESSING SECTOR

The industrial fish processing sector emerged in Kenya in the early 1980s. By 1987 ten factories were operating. At that time, no facilities had been established in Tanzania or Uganda, and Kenyan processors sourced fish in all three countries. Processing capacity continued to expand in the early 1990s, with the number of facilities peaking at 15 in 1995. The rapid growth of the industrial fish processing sector was motivated by rising demand for Nile perch in exports markets, particularly the European Union. However, after peaking in the mid-1990s, exports began to diminish because of overfishing and poor quality. By 1997 the sector as a whole was operating at 55 percent of its 380 ton/day capacity. Three factories accounted for more than half of total operating capacity.

In the 1990s, it became evident that the rapid expansion of the Nile perch fishery was not sustainable. Catches began to decline despite continual increases in fishing effort. Supply problems were initially overcome by sourcing outside Kenyan waters. There was evidence of significant "undocumented" exports of fish from Tanzania and Uganda. Several operators established sister factories in Tanzania or Uganda, which they used as a source of supply of raw or semi-processed fish for their Kenyan plants. Such border movements have now been stopped through concerted action by the three governments.

The sector as a whole is characterized by low levels of added value. Most exports are in the form of block frozen bulk packs of semi-processed filets—a problem given the increasing constraints on the supply of raw fish. Some processors have explored opportunities for value-added products or made attempts to diversify into other sectors—for example, bakery products, meat, and ice cream. Gross margins remain low and extremely sensitive to the landed price of Nile perch.

In 1997, the hygiene standards of fish processing plants in Kenya became an issue after a series of inspection visits by the European Commission found nonconformity with its requirements. Many plants had been converted from premises built for another reason, including the manufacturing of nonfood products. Their suitability and general level of repair varied greatly. Further, although most plants claimed to be aware of regulations in the European Union and to have complied with them, there were significant differences in the extent to which they had actually implemented the EU-required standards of hygiene and quality management.

Over the period 1998–2002, significant efforts were made to raise hygiene standards to comply with EU requirements. When the European Commission again conducted inspections in March 2002, it found that most facilities met the requirements of EU legislation, with minor exceptions. Some fish processing facilities that were unable to upgrade their facilities exited from the sector. Typically, these facilities had been operating at very low levels of capacity and were unable to offset the additional costs of compliance through increases in production volumes or value-added.

The reactions of the fish processing sector in Kenya to the hygiene requirements of the European Union can be characterized as reactive compliance and reactive exit. There is little or no evidence of voice. The strategic options of all firms in the sector were constrained by shortages in the supply of raw materials and limited possibilities for adding value. While those factories that remain have been able to gain from the exit of other operators, their ability to exploit the potential benefits from more proactive strategies was constrained by the economic realities of the sector.

Source: Henson and Mitullah (2004)

BOX 3.4 ANTIBIOTICS IN FARMED SHRIMP: RESPONSES BY THAILAND'S GOVERNMENT AND INDUSTRY

In November 2001, the Greenpeace environmental group reported that canned shrimp products from Thailand had tested positive for chloramphenicol (a banned antibiotic thought to cause leukemia in one out of 20,000 exposed people). The report was based on analysis of samples pulled randomly from supermarket shelves in Austria. Product recalls from retail distribution channels followed, causing confusion among wholesalers, processors, and importers, who had received no guidance from authorities on dealing with such situations. On March 14, 2002, Thailand's competent authority for animal products, the Department of Livestock Development of the Ministry of Agriculture and Cooperatives, was informed that trace amount of nitrofurans (banned, carcinogenic anti-microbial drugs) had been found in chilled/frozen shrimp and prawn imports from Thailand. Under the European Union's zero tolerance rules for banned chemicals, any product found contaminated with the banned antibiotic was subsequently destroyed. The destruction resulted in monetary losses and eroded client confidence. All Thai shrimp products entering the European Union were subjected to inspections thereafter.

To resolve the drug residue problems, the private and public sectors took several remedial actions. For example, in an effort to minimize the use of chemicals and reduce the chance of leaving residues in shrimp harvests, farmers adopted two strategies. First, they switched to a more disease-resistant shrimp strain (*P. vannamei*). Second, they adopted probiotic farming, which makes use of a microbiological formulation to clean ponds of feed wastes and adds nutrients to farmed shrimp.

At the same time, shrimp exporters adjusted their procurement arrangements. The trend now is to use product-quality segmentation in supplying different markets. Large exporters normally procure products destined for the high-end markets from trusted suppliers or from their own farms. For their less critical consumers, exporters procure raw materials from new suppliers or the central market.

The Thai government, too, has taken steps. It has substantially tightened controls over the import of chloramphenicol, for example. The Department of Fisheries formed a special committee to carry out periodic inspection in shrimp producing provinces to prevent the use of chloramphenicol and other banned chemicals. DOF representatives are now inspecting shrimp to ensure that they are free from contaminants before sale. DOF has urged shrimp farmers to adopt a code of conduct to ensure product safety from farm to table. Extension work has been intensified to educate farmers on the use of chemicals and the adverse consequences of using banned chemicals.

Source: Manarungsan and others (forthcoming)

Horticultural Products and Spices

The research work undertaken for this study included case studies related to horticultural and spice subsectors in India, Jamaica, Kenya, Morocco, and Thailand. The Kenyan and Moroccan horticultural industries are oriented to the EU market; the Jamaican horticultural industry is centered on the United States and secondarily the United Kingdom; the Thai vegetable industry is oriented to the Japanese and European markets; and the Indian spice industry trades globally. In each case, producers and exporters have long been required to comply with quality parameters and to meet demands in terms of supply continuity, seasonality, and so on. Over the last decade, each market has faced more explicit and increasingly stringent food safety and phytosanitary requirements, coming from official regulatory agencies and private buyers.

TABLE 3.5 ANALYSIS OF STRATEGIC APPROACHES TO COMPLIANCE WITH FOOD SAFETY AND PHYTOSANITARY STANDARDS FOR HORTICULTURAL PRODUCTS AND SPICES

	Reactive	Proactive
Kenya—Fresh vegetables		
Exit	<ul style="list-style-type: none"> Some farmers have switched to supplying processors or the domestic market Some exporters have shifted focus from the European Union to Middle East markets 	
Compliance	<ul style="list-style-type: none"> Segregation of product sources and development of traceability systems Public/private awareness-raising/training in good agricultural and pest management practices Upgrading of staffing and systems for food safety management in packinghouses Upgrading of government inspection and laboratory testing capacities 	<ul style="list-style-type: none"> Backward integration by leading exporters into own farm production; some forward integration into overseas distribution (offensive) Development of industry codes of practice related to product safety, environmental management, and social issues Expansion/modernization of packinghouses, including high-care facilities (offensive) New product R&D Intensification of out-grower oversight and requirements
India—Spices		
Exit	<ul style="list-style-type: none"> Exporters withdraw from certain markets where they cannot meet or guarantee pesticide residue standards 	
Compliance	<ul style="list-style-type: none"> Selective contract farming and intermediary vendor screening Government-led programs to raise farmer awareness about hazards and improve post-harvest (drying) practices Investment in cleaning, processing, and product sterilization equipment Investment in laboratory equipment and broader range of tests 	<ul style="list-style-type: none"> Packers adopt HACCP, ISO 9000, and other management systems Pilot initiatives on organic spice production supported by government and NGOs (offensive) More exporter emphasis on custom-made, value-added products (offensive)
Voice	<ul style="list-style-type: none"> Bilateral complaints on sampling/testing procedures Coordinated effort to establish additional MRL tolerances for pesticides used for spices 	
Thailand—Vegetables		
Compliance	<ul style="list-style-type: none"> Department of Agriculture promotes good agricultural practices in major production areas 	<ul style="list-style-type: none"> Shift to integrated and coordinated procurement and away from open-market sourcing Implementation of farmer registration system (by government) for traceability Several firms enter into joint venture partnerships with international buyers
Jamaica—Fruits and Vegetables		
Exit	<ul style="list-style-type: none"> Withdrawal from U.S. mango market as phytosanitary measure is not cost-effective and alternative market outlets exist 	<ul style="list-style-type: none"> One major firm withdraws from fresh trade and shifts to processed exports to avoid plant-health and pesticide-residue issues
Compliance	<ul style="list-style-type: none"> Development of one-stop facilities for product inspection, fumigation, and certification Implementation of pre-approval system for exporters of processed foods Implementation of pre-clearance program with U.S. APHIS 	<ul style="list-style-type: none"> Several firms develop own papaya farms in response to widespread disease incidence on out-grower farms
Voice	<ul style="list-style-type: none"> Seeking MRL tolerance standards for yams through COLEACP 	

Source: Background Case Studies

Each industry has faced challenges related to pesticide use and residues, plant health protection, and, to a lesser extent, microbiological hazards. Strategies have been deployed to better control or monitor product/raw material sourcing, improve hygienic conditions and systems for quality and safety assurance in post-harvest and packing operations, address plant health risks, and provide acceptable product testing and certification. The dominant approach to rising standards in the four industries studied has been to strive for compliance (Table 3.5). In contrast with the cases summarized above for fish products, several of the horticultural and spice cases reveal a greater incidence of proactive measures. In several cases attempts have also been made to influence the prevailing standards. Some producers and exporters have exited certain markets or supply chains rather than invest in compliance.

The emerging standards have put pressure on exporter/processors to adjust their *procurement arrangements* or at least intensify their oversight of those arrangements. Three approaches have been common: backward integration into farming; contractual coordination; and modified open sourcing with increased prescreening of vendors and producers. In several cases, these have been supplemented by programs to increase farmer awareness of food safety risks and promote good agricultural practices and post-harvest methods.

In Kenya, exporters traditionally procured their supplies through a combination of loose contracts with small and larger farmers and daily open-market purchases with cash. Because most sales were to overseas wholesale markets, and because freight space availability was uncertain, exporters wanted to retain flexibility. However, following shifts to seasonal contracting of chartered air-freight services and greater reliance on sales to supermarket chains that demand reliability, product safety, and traceability, the leading exporters were obliged to greatly increase their control over product sourcing. Beginning in the mid-1990s, many of the leading firms leased or purchased land to develop their own farms, using them to supply their core needs for major clients and to experiment with new crops. Continued supplies from smallholder out-growers were segregated and channeled to less demanding clients. Larger out-growers provided supplemental supplies.

More recently, several of the leading Kenyan firms, aided by support under the EU-financed Pesticides Initiatives Programme (PIP), have moved to expand their smallholder out-grower arrangements, with more intensive grower oversight and product traceability (sometimes through grower groups). Certain companies have developed their own codes of practice to govern their relationships with smallholders, with detailed provisions for farmer conduct and company supervision of land management, agronomic practices, pesticide use and disposal, hygiene and safety, and labor and environmental standards. Most smaller exporters generally lack a field presence, however, and some have come to rely on a product sourcing system run by a government agency. That program provides some awareness training for farmers and geographic (but not farm-specific) traceability.

In Thailand, where large tracts of suitable land are difficult to find in many regions, exporters have adopted a strategy of intensifying their contractual relationships with smallholder farmers, typically through farmer groups, and relying considerably less on

open-market purchases. In doing so, they were facilitated by the Department of Agriculture which established a farmer registration system that has enabled both exporters and the government to trace back produce found to be noncompliant with regulations on residues of pesticides.

Less significant product procurement shifts have occurred in the Indian spice and Jamaican horticultural industries. In India, the bulk of spice production is consumed and marketed domestically. Relatively little production is specifically dedicated for exports. Traditionally, processor/exporters have sourced their supplies from primary or secondary intermediaries—traders operating in or around the main production areas. Most of the production is by smallholder farmers, with perhaps 15 percent of national production occurring on medium-scale farms. Vertical integration of production and processing is rare.

With the increased attention in some markets to pesticide residues and aflatoxin contamination, exporters have modified their procurement arrangements. More radical changes have not been warranted, however, because the most demanding clients account for a very small share of overall sales of the pertinent spices.³⁶ In order to retain their position in demanding markets, a few exporters have moved to contract a proportion of their supplies from individual farmers. Others have advised their vendors of their requirements and more carefully monitored them. Some companies have purchased mobile testing kits to take into the field to test chilies for aflatoxin before committing to purchases. Certain companies, NGOs, and agencies of government have sought additional ways to influence production practices through training days, promotion of integrated pest management, and, in some locales, organic production of spices.

Despite persistent and periodic problems with pesticide residues and plant pests and diseases, Jamaica's nontraditional fruit and vegetable exporters have made few changes in their product procurement arrangements. Most operate on a small scale with limited staff and financial resources. The products they export are also staples in the domestic market. Their buyers abroad typically service Caribbean immigrant communities and place few demands on their Jamaican suppliers with regard to food safety or good agricultural practices. Product procurement remains informal and features various intermediaries who purchase the crops for resale to local distributors and exporters. A major exception is the papaya industry. Several exporters have dedicated supermarket buyers in the United Kingdom that want a particular variety and demand compliance with good agricultural practices and packinghouse hygiene standards. This reality, and past experience with widespread viral and bacterial diseases, has led to some vertical integration of papaya operations as well as technological innovations such as ozone treatment against anthracnose.

³⁶ For example, India produces over one million tons of dried chilies. Of this, some 900,000 tons are consumed domestically, while the bulk of exports is sent to other developing countries where food safety standards generally are not yet applied. Generally less than 8,000 tons have been exported annually to the European Union, with a (small) portion going to Spain, Italy, and Germany, where Indian exporters have encountered product rejections on food safety grounds.

Hence, across the studied cases, various factors have affected how firms have adjusted their arrangements for procuring products. Those factors include the specificity of demands for control and traceability from core clients, the size of the firm and its financial and technical resources, existing land tenure and the nature of land markets, and the availability and capacity of public sector resources to support supply chain coordination.

BOX 3.5 VOICE IN THE INDIAN SPICE TRADE

Chilies are one of the few spices produced in India for which agro-chemicals are commonly used. Chilies are vulnerable to a variety of pests and diseases, which can be controlled only with agrochemicals and crop rotations. Chemicals are sometimes used in the production of coriander, fennel, and other seed spices, but rarely in the production of India's other major spices. While there have been periodic concerns or campaigns to address the risks that agro-chemicals pose to farmers and agricultural workers in India, until the 1990s there was not much concern over pesticide residues in spices.

This began to change in the early 1990s in the context of the European Union's program to harmonize permissible maximum residue limits (MRLs) in food products. Initially, questions about spices were raised by regulators and buyers in Germany. In 1994–95, several consignments of Indian dried chilies were rejected by Spanish authorities because pesticide residues exceeded the permissible MRLs for fresh/green chilies. Discussions with Spanish authorities to apply a "multiplication factor" for pesticide residues in dried chilies were unsuccessful, and trade with that market subsided. In the late 1990s, additional consignments of Indian chilies and other spices were rejected in Europe and elsewhere, frequently because no established tolerance level existed for particular pesticides and spices.

There exist only a handful of Codex standards for MRLs related to agro-chemical use on spices. Individual countries have set MRLs themselves, generally for particular spices grown in small quantities in their own countries. For example, there are some 30–40 official MRLs for spices in the United States, Germany, Spain, and Australia—the majority related to a few individual crops. Yet these countries have hundreds or even thousands of MRLs for combinations of fruits or vegetables and active chemical ingredients. Most of the spice and pesticide MRLs that do exist vary between countries.

India and other spice exporting countries are therefore vulnerable should regulatory authorities and private buyers devote more attention to pesticide residues. In response, India has addressed pesticide use practices in its own industry and sought to influence the international rules of the game. Working in conjunction with the American Spice Trade Association, the European and Japanese spice trade associations, and several other parties, the India Spices Board and the All India Spice Exporters Forum established an International Organization of Spice Trade Associations that obtained observer status at the Codex Committee on Pesticide Residues. Given the paucity of established MRLs for spices grown in tropical countries, it was proposed that new MRLs be established on the basis of monitoring data made available by both importing and exporting countries—far less costly and more practical than starting from scratch and undertaking multiyear field trials. This proposal was accepted in 2002 by Codex's Joint Meeting on Pesticide Residues (JMPR), which has since issued guidelines on how the data will be collected and used.

With regard to chilies, a different approach has been taken. There are already more than 20 pesticides for which MRLs have been set in Europe, North America, or elsewhere in relation to fresh peppers. India has proposed that a dehydration factor of 10 be applied to account for the magnification of pesticide residues in dried chilies. In other words, while the established MRL for carbaryl is 5 mg/kg in fresh pepper, it would be 50 mg/kg in dried chilies. A similar approach has been proposed for other vegetables that are used as spices when dried (garlic, onion). Members of the spice industry have submitted evidence to the JMPR to support the derivation of dehydration factors.

Source: Jaffee (forthcoming)

In some of the case study industries, significant changes have been made in *packinghouse and processor operations*. For example, in Kenya, most fresh produce exporters traditionally operated out of relatively simple warehouses, consisting of concrete floors (for sorting), aluminum roofing, and rudimentary cold storage facilities. Quality control essentially involved re-grading and repacking produce. While one or two firms had somewhat more sophisticated systems, the above description represents the norm in the industry through the early 1990s.

Over the past decade very substantial investment has been made in the modernization and expansion of packinghouse facilities and associated systems for quality assurance and food safety. Much of this investment has been made by about a dozen companies whose business strategies have increasingly targeted British and continental supermarkets. These companies have made major upgrades to warehouses and packinghouses. So-called high-care facilities have been built, dedicated to particular segments of the business. Major investments have gone into air-conditioning and ventilation systems, water purification systems, forced air cooling systems, and a wide variety of equipment to attain very high standards of hygiene within the packinghouse operations. A few companies have also invested in on-site laboratories to test products and staff health.

Accompanying the above improvements have been enormous changes in quality assurance and food safety management systems by the leading export companies. Each of these companies has hired university-trained food technologists and scientists, adopted and refined HACCP systems and put in place other formal arrangements and documentation for improved quality assurance. For those firms with high-care product lines, this dimension of their business involves very demanding systems for product testing, environmental testing (for example, daily water tests), and staff health testing.

There also have been changes in staff relations and conditions to cover the social aspects of retailer codes. In the past, export firms mainly employed casual labor and provided only very basic training. Firms supplying the major supermarkets, and especially those dealing in high-care products, have increasingly employed workers on more extended contracts and have provided food safety and hygiene training, as well as health counseling. The larger firms have their own food canteens, small medical staffs, and clinics.

Not all companies have been willing or able to transform their operations. Kenya has always had a large number of small-scale and part-time exporters that coexist with the dozen or so industry leaders. At times, more than a hundred firms would be registered as exporters, yet in recent years their numbers have declined. Still, there remain some 15–20 smaller companies with annual exports of 100–500 metric tons per year. For the most part, these firms have made only modest changes to their facilities and systems and have continued to direct their sales to British or continental wholesale markets and the ethnic food market.³⁷

³⁷ Some new entrants do not own a packing house but instead rent temporary packing/storage space near the airport at a facility managed by the Horticultural Crops Development Authority. While this space is relatively inexpensive it does not provide hygienic operating conditions.

BOX 3.6 PERUVIAN ASPARAGUS EXPORTS: SUCCESS THROUGH STANDARDS

Realizing that it was in the best interest of the country, the leaders of Peru's asparagus industry and government specialists worked together to bring Peruvian agricultural standards in line with international norms. Both the industry and Peru have greatly benefited as a result. Over the past decade, Peru has quickly risen to become one of the world's largest exporters of asparagus. This is particularly true for fresh green asparagus, and to a lesser extent for fresh white asparagus and canned asparagus. In 2002, export revenue for all forms and presentations reached \$187 million, representing nearly 25 percent of the value of Peru's agricultural exports. Peru is able to produce quality asparagus year-round, yet in certain seasons high air and sea transportation costs prevent it from matching prices with inexpensive asparagus from Mexico. Nonetheless, the Peruvians have continued to increase exports and gain market share during their main season by growing asparagus of consistently higher quality that can be internationally certified with respect to good agricultural practices, good manufacturing practices, and HACCP.

In 1997, Spanish health authorities asserted that two cases of botulism had been caused by consumption of canned Peruvian asparagus. Despite assurances from the Peruvian government and companies, press coverage of the botulism scare left an unfavorable impression among consumers in European markets, causing sales to slump in Peru's leading market. The incident helped motivate the industry and government to take action, by reinforcing the fact that one careless (usually artisanal) exporter could disrupt markets. Beginning in 1998, officials of the Peruvian Commission for Export Promotion (PROMPEX) convinced the asparagus industry to implement the Codex code of practice on food hygiene. PROMPEX specialists worked with industry leaders and production managers to ensure proper implementation. The industry soon saw improved production and processing methods, as well as better product quality and safety.

In 2001, national fresh asparagus norms were published. They provided a quality and performance baseline for the industry that allowed many firms and farms to generate the skills and experience needed to be certified under stringent international standards. Many large exporters have reached the level where they can now be certified under the even stricter EUREPGAP protocol. Looking ahead, the Peruvian asparagus industry should be well positioned to adjust to new or more stringent requirements from its trade partners, based on continued strong leadership and public-private cooperation.

Source: T. O'Brien, IICA, communication

In India, the majority of spice exporting companies traditionally undertook very basic grading, cleaning, and packing operations. For black pepper, most operations were done by hand, with the pepper being shaken through sieves, hand-washed, sun-dried, and then hand-packed in sacks. Yet after a series of product rejections in the mid-to-late 1980s, several companies invested in mechanical cleaning, washing, drying, and packing equipment, obtaining modest price premiums for the cleaner and better graded product. Subsequent regulatory concern about microbiological contamination of black pepper in the United States served as a catalyst for investment in sterilization facilities by the leading companies. In line with broader changes in the international spices industry, in the mid-1990s a growing number of Indian spice companies began to adopt HACCP, ISO 9000, and other certified food safety or quality assurance systems.

By 2003, some 14 companies were certified under ISO 9000 and 19 companies were approved under the Indian Spices Logo, a program initiated by the Spices Board to promote good hygiene and manufacturing practices within the industry. Only firms earning the logo have been eligible for cost-sharing grants provided by the Spices Board for investments in factory equipment and laboratory facilities. With the emergence in the 1990s of concerns in some markets about pesticide residues and aflatoxin in chilies and

other spices, each of the leading Indian spice companies established and expanded its laboratory facilities, while the Spices Board continued to build up its own laboratory testing capacities to serve smaller exporters and carry out surveillance activities.

BOX 3.7 ADDRESSING CITRUS CANKER IN ARGENTINA

Citrus canker was introduced into Argentina in 1928. By the late 1970s the aggressive Asian strain of the disease was so widespread that eradication efforts were abandoned in favor of control methods. Argentina and Florida researchers developed a copper spray program, and windbreaks were planted to reduce the spread of bacteria. Yet the low returns to growers did not encourage the use of adequate spray programs and eventually led to the abandonment of citrus groves. Citrus canker bacteria built up in neglected grapefruit groves. By 1990, Asian citrus canker was considered endemic in Argentina. The high cost of maintaining export quality in grapefruit and navel oranges (plus global oversupply), influenced citrus growers to switch to varieties less susceptible to canker, such as mandarins (Satsumas) and Valencia oranges.

In 1997, the European Union placed restrictions on citrus grown in canker endemic areas. To export fresh fruit to European Union, it must be harvested from blocks certified to be canker-free, requiring multiple inspections during and after harvests. Certification increased grove-care costs because of additional copper sprays and use of more windbreaks. Packing costs increased with inspection fees and regulations that prohibited the co-mingling of certified and non-certified fruits. All certification costs are currently charged to the citrus grower. Currently, the primary market for the citrus grown in the northeast provinces is Argentina's domestic market, although Argentina has been trying to develop the Asian market. The United States has amended its regulations and now allow limited importation of citrus from four states in the northwestern part of Argentina. The regulations allow the importation of grapefruit, lemons, and oranges under certain conditions and with limited distribution.

Source: Canteros (2000), Muraro and others (2001)

Sanitary Control Strategies for Livestock

As part of the World Bank's SPS-related research program, a study was commissioned on the approaches used by the nations of Latin America's Southern Cone to manage the risks (and trade relations) associated with foot and mouth disease (FMD). Selective attention was also given to other experiences highlighted in the existing literature. In the pages that follow, we examine criteria for determining the most appropriate sanitary control strategies and review some recent experiences in applying various strategies.

When seeking appropriate sanitary control strategies, decision-makers need to consider several criteria. First, how effective is the strategy? Second, how much does it cost compared to alternative strategies? Third, what are the prospects for spillover effects (for example, in increased productivity) onto the domestic industry? Increased benefits for local producers of disease control or eradication are often the dominant factor in justifying the eradication of a certain disease.³⁸ Fourth, what is the market potential of the product, leaving aside the disease control factor? For example, Sub-Saharan and South Asian countries might focus more on regional markets, with easier standards for FMD

³⁸ For example, in a country with a traditional, subsistence-oriented livestock sector, FMD is not a serious production constraint; without a strong export potential, eradication of FMD disease is not economically justified.

and other diseases, because the quality of their beef cattle population would, at best, enable access only to lower-value markets in industrialized countries. Fifth, what are the underlying characteristics of the disease—such as the length of the incubation period, the level of the infection, and the ease of its eradication?³⁹ Finally, what is the specific product involved? Live animals generally are more strictly regulated than processed food. Within processed food, higher levels of processing are generally associated with lesser restrictions.

BOX 3.8 ALTERNATIVE APPROACHES TO CONTROLLING ENDEMIC ANIMAL DISEASES

When a country does not have an endemic disease, the main tool is mass vaccination, reducing the incidence of a disease to localized levels, followed by a menu of options as used in a disease-free country experiencing an outbreak of an OIE List A disease. These are summarized below.

- Quarantine and restriction of livestock movements at the local, regional, or national level, in accordance with the severity of the outbreak
- “Stamping out,” which can be restricted to the destruction of diseased animals but normally also includes animals that could have been in contact with the infected animal population (so-called susceptible animals)
- Ring vaccination or immunizing the population in an area surrounding the disease outbreak, often in combination with stamping out
- Vaccination of the entire population, accepting that such a strategy might preclude access to some markets for a longer period than under the stamping out and limited vaccination strategies.

Applying the above criteria, countries that experience an outbreak of an OIE List A disease or for which one or more such diseases are endemic, have the following strategic options:

- *Exit.* Withdrawal from industrialized country markets, in particular those for sensitive products (for example, chilled meat) to concentrate on markets with less stringent requirements, such as regional markets (for example the Gulf areas and East Asia), and less sensitive products (such as canned and other processed meats). Exit will be the most logical option for a country with products of a quality and price below the standard of the more demanding markets, and a disease that is not easy to control.⁴⁰ Some cases have been observed of temporary exit from certain markets during a disease outbreak, while diversifying into other markets. Argentina pursued this approach in 2001 and 2002 (Box 3.9).

³⁹ For example, mad cow disease (BSE) generally requires a disease free-period of seven years for a country to carry Status I or II (highly unlikely or unlikely, respectively). In contrast, disease-free status for FMD requires only one year without disease outbreaks, in cases where the country does not vaccinate animals, and two years in cases where it does vaccinate. Most countries that are FMD-free without vaccination generally limit their imports of fresh beef to other countries that are similarly classified. Exceptions may be made for cooked and processed beef. However, FMD is a much more contagious disease than BSE and is quite difficult to eradicate because there are multiple strains and the vaccine provides a relatively short period of immunity.

⁴⁰ FMD in Sub-Saharan Africa, for example, belongs in this category. It has limited effects on animal productivity in traditional systems, is difficult to control, and, even if controlled, yields products of low quality.

- *Limited compliance.* Seeking to eradicate the disease in parts of the country or for specific enterprises. Recent changes in the OIE standards, under the so-called compartmentalization principle,⁴¹ allow countries to request disease-free status for parts of the country or for specific enterprises. This would be a likely option for countries and diseases for which control would have a strong spin-off benefit on local production. Sometimes, favored by natural barriers, SPS control is relatively easy in a particular region, and enterprises capable of following strict guidelines for trapping, sampling, and treating products, as well as maintaining records, can then access lucrative foreign markets. This was the preferred strategy of the large integrated poultry and pig producers in Thailand during the Asian bird flu outbreak in 2003–04. They were able to control the disease by maintaining animals in a fully hygienic, closed system.
- *Strict compliance.* Seeking disease-free status for the entire country, through combinations of vaccination, movement control, and quarantine, and stamping out of infected and susceptible animals. This is the preferred strategy for countries with good potential in industrialized country markets and for diseases that are relatively easy to control. The Southern Cone countries are pursuing this strategy for FMD.
- *Voice.* This is generally employed simultaneously with compliance efforts. In principle, the International Committee of the OIE, with delegates from the public veterinary services of member countries, allows developing countries to participate in decision-making on international standards. In practice, however, the discussions are often dominated by representatives from industrialized countries, and the private sector is poorly represented. Moreover, accessing new markets requires a particularly high level of voice at the bilateral level, as shown by Argentina (Box 3.9).

In theory, decisions about exit, compliance, and voice should be based on a risk analysis, including a consideration of cost and benefit. Established methodologies for such analysis have been demonstrated in several developing countries (Perry, 2003). Yet in many developing countries the capacity to undertake it is severely lacking.

Various approaches were used in an effort to eradicate FMD from the Southern Cone of Latin America and contagious bovine pleuro-pneumonia (CBPP) from Botswana (Table 3.6). The lessons emerging from these cases are as follows:

- Lack of capacity, but often political pressure on veterinary services, can lead to delaying the declaration by veterinary authorities of disease outbreaks—or the downplaying of their severity. Significant commercial interests may be at stake, or authorities may be unwilling to acknowledge that prevention measures have proven inadequate. Yet the advantage of maintaining market access through denial is often more than offset by later losses in productivity and trust in export markets. This has been shown for Argentina, as well as the recent case of Avian bird flu in East Asia.

⁴¹ A compartment is described by OIE as an autonomous epidemiological entity defined on the basis of either geography (zone) or management (enterprise) for the purpose of international trade.

BOX 3.9 ARGENTINA: MARKET SHIFTS AND VOICE IN AN EMERGENCY

The beef industry in Argentina is an economically important sector, with exports averaging about US\$360 million per year in the late 1990s. Soon after the OIE certified in 2000 that Argentina was free of FMD without vaccination, the country experienced a new outbreak that spread rapidly throughout much of the country. When beef exports to the United States and European Union were suspended, efforts to sell into alternative markets intensified. Exports were diverted to Eastern European, Middle Eastern, and Latin American countries, generally at considerably lower prices than those fetched in OECD markets. The average annual export value in 2000–03 was just US\$ 170 million. Even the new markets were not easily accessible. Argentina had to challenge the sanitary regulations of several countries. In 2001/2002, it submitted complaints to the SPS Committee regarding the FMD-related restrictions of Bolivia, Chile, Colombia, Indonesia, Mexico, and Venezuela, and it negotiated bilaterally with several other countries.

- Stamping out, in particular focusing only on diseased and susceptible animals in a limited area, often is not enough. Farmer resistance in the absence of adequate compensation schemes and difficulties in maintaining strict movement controls, often cause the disease to elude the restrictions and spread to other areas. This has been shown in the case of FMD in all three Southern Cone countries. Vaccination is then typically pursued as a last resort. Ring vaccination is often also needed to ease the pressure on destruction facilities.
- Trust in the reliability of veterinary services plays an important role in regaining entry to industrialized country markets. This is shown by the case of Argentina's efforts to regain entry to the United States and European Union following the 2001 outbreak. Individual tracing for cattle is expensive and not foolproof. Yet all Southern Cone countries have adopted it since the outbreak of FMD in 2000 in an effort to rebuild trust in their national systems.
- Disease eradication often requires multicountry (regional) approaches, rather than national campaigns alone. For example, the recurrent outbreaks of FMD in the three beef exporting countries of the Southern Cone originated at the borders with Bolivia and Paraguay, where FMD is endemic.
- Strong private-public partnerships are often required. With many externalities involved, there is a solid justification for strong public sector involvement in the control or eradication of List A diseases. However, many tasks can be more efficiently carried out by private operators under the supervision of public institutions. Thus, Brazil has relied heavily on farmers' organizations and links with private veterinarians in controlling FMD (Dubois and Moura, 2004), whereas Uruguay has relied more heavily on strengthening the public sector.

TABLE 3.6 COMPARATIVE EXPERIENCES WITH ANIMAL DISEASE CONTROL STRATEGIES

Country	Disease outbreak characteristics	Immediate actions	Impact effectiveness	Follow-up actions	Overall impact	Comments
Brazil	FMD outbreak, July 2000–May 2001, largely localized in Rio Grande del Sul	Stamping out and movement control	Effective enforcement but resistance from farmers Lost U.S. and Asian markets, but maintained EU access	Shifted to a vaccination policy Improvements in overall sanitary and traceability system Some relocation to lower-value markets	Limited, except for Rio Grande del Sul. Total of 28,000 animals culled. Expectations of reopening of U.S. markets	Fast reactions led to reduction of impact
Argentina	FMD outbreak, July 2000–January 2002, in Pilcomayo near Paraguayan border	Stamping out and movement control	Not effective, with disease reemerging in December 2000. Lost major export markets for fresh meat in 2001, lasting through present time	Compartmentalization, with high frequency of vaccination of all cattle. Introduction of traceability systems. Also, relocation to alternative, less attractive markets (Middle East)	150,000 infected animals. Total vaccination costs of US\$ 84.2 million, costs of foregone production estimated at US\$ 40 million per month	Continued export ban after new outbreaks along Bolivian border, plus lack of trust in Argentina's control services
Uruguay	FMD outbreak, July 2000, localized in the Artiga region near Brazilian border. Later (April 2001) an outbreak in Soriano region	Stamping out and ring vaccination in Artiga and later in Soriano region	Farmer resistance to stamping out, and failed control in the case of a second outbreak. Loss of main markets	Mass vaccination in entire country. Slaughter ban without vaccination certificate. Strong education campaign, and improvement of current traceability system to gain EU acceptance	About 77,000 infected animals. Value of exports fell by 40 percent (US\$ 152 million) Now 99 percent vaccination coverage Deboned, chilled, and frozen beef imports again allowed in U.S. markets following USDA risk assessment	After flawed initial reaction, major improvements in public sector lead to reopening of markets
Botswana	CBPP outbreak in 1995 in Ngamiland	Fencing of area, with destruction of sick animals and vaccination of healthy animals	Continued outbreaks, loss of preferential EU market	Destruction of entire cattle population of Ngamiland (320,000 animals)	Total direct costs about US\$ 100 million; other costs (indemnities), US\$ 400 million	Major social impact even five years later

Source: Background Case Studies

3.5 Factors Affecting the Viability of Alternative Strategies

Table 3.7 draws from our case study analyses to summarize the factors that affect the viability of alternative compliance and other standards-related strategies. These include the ability to pursue more pro-active and offensive ‘voice’ and ‘compliance’ approaches.

TABLE 3.7 FACTORS INFLUENCING STRATEGY VIABILITY

Factor	Exit	Voice	Compliance
Size of firm or industry	-	++	+
Share of target market (segment)	-	++	+
Reputation for quality/safety	+	++	+
Suitability of legal/regulatory framework		++	+
Leadership/coordination within private sector		+	++
Private sector management/technical capacity	+	+	++
Public sector administration/technical capacities	+	++	++
Clarity of institutional responsibilities/procedures		+	+
Geographic/agro-climatic factors	-/+		-/+
Circumstances (for example, a “crisis”)	++	-	-/+

For individual exporters, enterprise size is a key variable in the ability to be proactive and offensive. There are significant economies of scale in compliance, so unit costs are lower for larger enterprises. For example, the introduction of EUREPGAP on citrus and tomato farms in Morocco involves some “lumpy” investments (input store rooms and hygiene facilities) that are not critically dependent on farm size. The economies of scale are likely to be less significant for firms that are highly diversified by products and markets. Large enterprises also may have greater scope to negotiate on standards-related requirements, especially with respect to major customers, and may have easier or cheaper access to capital. At the same time, however, the strategic options of all enterprises will be influenced by levels of managerial and technical capacity and overall organizational objectives. The reputation of the firm, the level of value-added in its products, and the degree to which products are branded are also important factors.

The size and structure of the industry and the competitive environment in which it operates also will influence the strategic options that exporters face, in particular their ability to be proactive. Salient factors include the overall output of the industry, levels of integration and coordination along the supply chain, modes of competition, levels of operating capacity, and levels and forms of industry cooperation. For example, even industries with a large supply base of small and medium-sized enterprises may be able to exert voice if there is a well-established and effective industry or trade organization. International market share and existence of alternative sources of supply are relevant as well, because they influence the ability of the standard-setter to go elsewhere should the

industry choose to not comply. The effectiveness (or absence) of industry leadership also appears to be critical in the process of achieving compliance, since leading firms or farms can set an example, test newer technologies or organizational approaches, and push others to follow in order to enhance or maintain the international reputation of the industry.

Strategic options in compliance will vary among countries, reflecting economic, political and social systems and norms, institutional structures, geographical size, and so on. The efficacy of general legal frameworks, food safety or agricultural health control systems, and general governance are important as well, both for the ability to comply and to project voice and for international receptiveness of one's efforts. Capacity and governance can also be a major constraint on pro-activity; it is difficult for a country or exporters to be first movers if they are struggling with basic capacity issues. A country that is perceived not to have its 'house in order', perhaps because it lacks an appropriate legal and regulatory framework, clarity in institutional roles, or particular capacities in the public or private sector, is unlikely to have much success in exercising voice, either on a multilateral or bilateral basis. Further, it may struggle to achieve compliance, even after allocating significant levels of financial or human resources. A country that is experiencing a disease outbreak, trade ban, or other form of crisis also cannot be expected to exercise effective voice, although exceptions exist (Box 3.9).

The case studies illustrate some of the common areas in which food safety and agricultural health control systems in developing countries are deficient (Table 3.8). These include weaknesses in legislative frameworks and noncompliance with international norms, limitations of surveillance and inspection systems and procedures, lack of laboratory testing capacity, and inadequate controls within the private sector. The case studies also support and emphasize the need for capacity development in developing countries—the focus of SPS-related technical assistance. However, the focus here is not just on the capacity to *comply* with standards in international trade, but rather the strategic options available to developing countries and, more specifically, the ability to implement proactive and offensive strategies. This suggests a wider perspective on capacity needs.

As the earlier discussion suggests, the strategic approach that is actually adopted in a particular circumstance will clearly be different over time, between countries, and across issues, reflecting attitudes toward standards, levels of risk adversity, and other factors. Indeed, in the short term many developing countries may lack the confidence to move away from their more traditional compliance-based strategies to become proactive and offensive. It is only through positive experiences, perhaps shared among countries, that they will recognize the potential benefits of being proactive and entering into negotiation. Building such confidence is itself a component of capacity building and will come only through learning while doing.

TABLE 3.8 COMMON FOOD SAFETY AND AGRICULTURAL HEALTH MANAGEMENT DEFICIENCIES IN FOCAL COMMODITY SUB-SECTORS

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

Source: Authors

In attempting to generalize about various factors that can influence the viability of different strategies, Table 3.7 glosses over some potentially significant differences in particular sectors. For example, in the horticultural cases examined, leadership (and the bulk of investment) in compliance has generally come from the private sector. Well-managed companies and supply chains, together with reasonably effective industry organizations, can frequently compensate for weaknesses in public services. This may involve undertaking certain functions on behalf of government or helping public agencies implement their functions (for example by providing vehicles to give public officials the needed mobility to do their jobs). Indeed, the horticultural product cases illustrate where particular private sector leaders have been highly proactive and offensive in response to emerging food safety or agricultural health requirements.

The discussion on agricultural health offers a contrasting picture. Here, the veterinary and phytosanitary policies and standards of importing countries have a dominant effect on market access. An outbreak of a disease can close markets entirely. This generally requires a set of control measures that go well beyond the realm of individual firms or farms. For example, large, vertically integrated supply chains for poultry or pork cannot do much against outbreaks of diseases among chickens and pigs held in the backyards of

villages. Likewise, a large horticultural producer can do little to control a plant pest that is endemic to smallholder producers. Both prevention and remedial measures require a more significant role for the public sector that will often encompass both those that produce for export and those who supply only domestic markets. Here, too, pro-activity is important—looking ahead to potential animal health problems and developing both surveillance systems and contingency plans for action may prove essential in retaining future market access. Burying your head in the sand and keeping quiet about animal disease problems is a very defensive strategy, one unlikely to enhance competitiveness in the medium and long term.

It is important to emphasize that the strategic options available to developing countries will reflect the complex interaction of a host of factors. It is not possible to draw hard and fast conclusions regarding, for example, the role of the public and private sector, or points at which it may be possible to be proactive, offensive, or to exhibit voice. The aim has been to show that a range of strategic options is potentially available, and that developing countries and providers of technical assistance should recognize and assess those options as part of efforts to build capacity and focus on approaches that are proactive and offensive, while providing the greatest possible opportunity to exhibit voice. In so doing, developing countries should be able to turn the perceived threats associated with new food safety or agricultural health standards into opportunities for competitive gain.

3.6 Conclusions

This chapter has examined the room for maneuver of developing countries in the face of an ever-changing and increasingly complex environment of SPS and other standards. It has emphasized the need for a strategic orientation and revealed a range of options, both conceptually and through the lens of country and industry experiences. We have argued that the underlying objective for capacity-building in this field needs to be recast—away from the conventional notion of coping strategies and technocratic problem-solving aimed at simple compliance, and away from an exclusive focus on the public sector.

Instead, capacity-building should be geared toward maximizing the strategic options available both to the government and to the private sector in developing countries. This puts a premium on the development of pertinent information systems and the evolution of effective partnerships between the public and private sectors. Further, it suggests that the real focus of such efforts should be enhancement of their ability to employ strategies that generate gains in competitiveness and in wider economic and social outcomes.

For policymakers and technical administrators in developing countries, the case study experiences highlighted here point to the value of fostering a forward-looking and strategic approach to managing SPS standards and international market access, taking into account current and prospective patterns of national agri-food trade. Priorities should be based on assessments of technical and commercial risks and opportunities, as well as the expected costs and benefits of alternative strategies. Developing countries should aim to be as proactive as possible in achieving compliance and in influencing the ways in

which the international rules of the game are applied. It is important, however, to distinguish between agricultural health and food safety challenges. Agricultural health matters carry the possibility of absolute barriers to market entry, whereas this is relatively rare in relation to food safety. Addressing trade-related agricultural health problems tends to require systemic approaches, transcending individual firms or supply chains.

That being said, experience also suggests that public administrators must move beyond control and policing functions to emphasize facilitative and awareness-building in quality assurance and SPS management. Because most day-to-day measures to achieve compliance with quality or SPS standards must be undertaken within the supply chain by commercial entities and farmers, improved cooperation between the public and private sectors is essential. Measures can be taken to encourage and facilitate collective action by firms and primary producers. In countries with limited administrative capacities, efforts should be made to delegate tasks to the private sector—with public oversight.

Agri-food processors and traders in developing countries clearly need to incorporate current and expected SPS and other standards requirements (for multiple markets) into their commercial strategy decisions, including those related to markets and products, the design and adjustment of product procurement systems, and possible investments in processing and marketing facilities. Firms should anticipate changes in official and private requirements in their major export markets and undertake proactive and preemptive measures to maintain or improve market positioning. Because independent or isolated actions may be very costly or ineffective, firms should work through industry and trade 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 throughout the private sector.

CHAPTER 4

AGRI-FOOD STANDARDS: THE COSTS AND BENEFITS OF COMPLIANCE AND NON-COMPLIANCE

4.1 Introduction

The trade and other impacts of new standards for agricultural and food products are related to the incidence and level of ‘compliance costs’ incurred by government and the private sector. Such costs are the focus of concern that developing countries are disadvantaged in complying with the new standards. In some cases, the prevailing capacity may be so weak as to require very substantial investment to attain compliance; in other cases, incremental recurrent costs may undermine exporter competitiveness. In practice, however, the costs of compliance for developing countries have rarely even been estimated.⁴² This lack of data reflects the considerable difficulties associated with undertaking such calculations.

Hard data on the benefits of compliance are also lacking because few studies have been carried out. Indeed, until recently it was not widely acknowledged that compliance actually yields benefits, especially in international trade performance (see, for example, Jaffee and Henson, 2004) and better controls over domestic food safety and agricultural health. Where benefits have been recognized, they have not been quantified. As a result, compliance is seen almost entirely as a cost of maintaining market access with few, if any, offsetting benefits.

This chapter undertakes a more rigorous examination of the costs and benefits of compliance. In so doing, it highlights the problem of disaggregating compliance costs from a larger and ongoing change. The case studies for this research program attempted to throw light on both costs and benefits; and how these vary between countries and firms and across types of standards. Some of the key findings from this work are discussed here.

4.2 Understanding Costs of Compliance

In the context of trade, compliance costs are defined as the additional costs necessarily incurred by government and/or private enterprises in meeting the requirements to comply with a given standard in a given external market. In the context of the strategic focus adopted in this report, this refers not just to the costs associated with compliance *per se*, but with all strategic responses to evolving standards. There are two key elements to this definition. First, it covers the costs that are ‘additional’ to those which would have otherwise been incurred by government and/or the private sector in the absence of the standard. Second, it refers to those costs that are ‘necessarily’ incurred in complying

⁴² In industrialized countries, a much more extensive literature estimates the costs and benefits associated with various food safety, environmental, and other standards. See, for example, OECD (2003b) and Unnevehr (2000).

with the standard. It is these two key concepts that create some of the problems associated with estimation of compliance costs.

In the case of regulatory requirements in international trade, costs are imposed on both the public and private sectors. In order to establish a ‘competent authority’ recognized by trading partners, government controls may need to be strengthened and institutional structures may need to be reformed. Processors may have to upgrade their procurement systems or hygiene controls in their food processes. In some cases the actions of the public and private sectors may substitute for one another (i.e. private testing instead of public testing); in other cases they may complement each other (i.e. improved public sampling and testing procedures alongside improved safety management systems at factory levels). The costs and benefits associated with both public and private actions need to be ascertained.

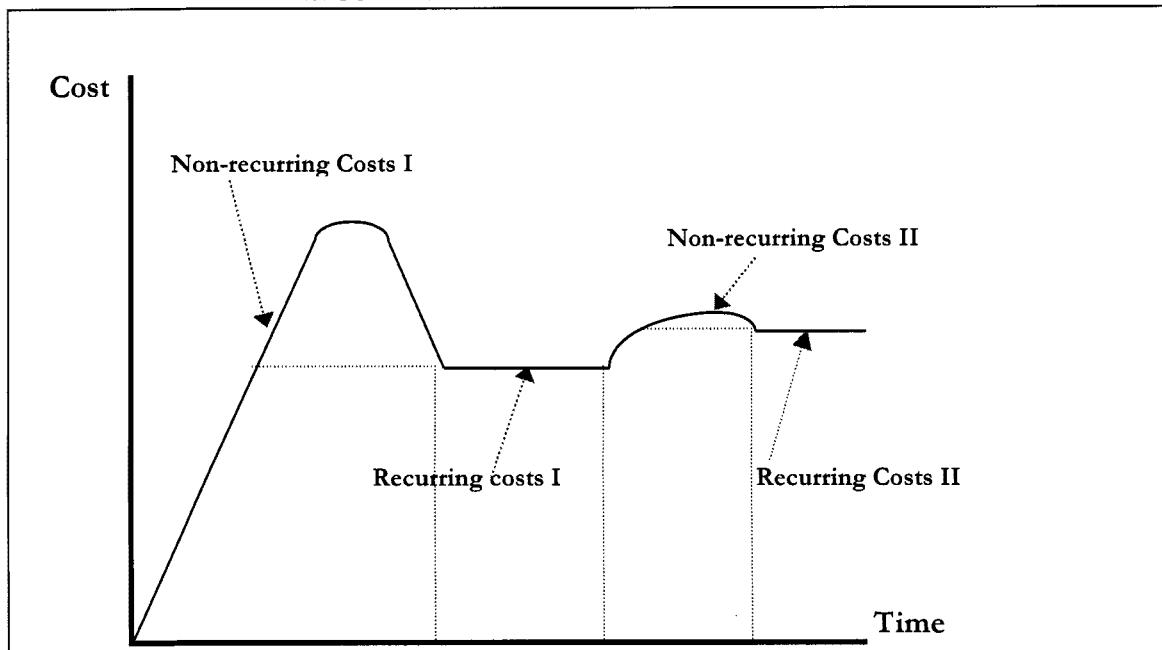
An important distinction is made according to the level of recurrence of compliance costs (Figure 4.1). Non-recurring costs are the one-off or time-limited investments made in order to be able to achieve compliance. Typically, these include the upgrading of laboratory infrastructure and processing facilities, establishing new procedures and the associated training of personnel, or the costs of designing new management systems such as the HACCP system for a food processor or a EUREPGAP compliant farm or out-grower system. Some of these are ‘lumpy’ investments for which there may be significant economies of scale. Recurring costs are borne over time and include the costs of maintaining regular surveillance and laboratory testing programs and the additional production costs associated with enhanced food safety controls. For some functions, non-recurring and recurring costs are substitutes for one another. For example, an individual exporter can choose between using an external laboratory to undertake routine product and input testing or establishing its own laboratory facilities that permit such tests to be undertaken at a lower unit cost.⁴³

Recurring and non-recurring costs can impede trade in a somewhat different manner and also influence the potential benefits that might flow from alternative strategic choices related to compliance. For example, ‘first movers’ might realize significant advantages if non-recurring costs are high and they have the resources to make needed investments ahead of their competitors. Yet, significant recurring costs can impede competitiveness by increasing unit production costs, especially where significant cost variations are borne by individual suppliers owing to local conditions.⁴⁴

⁴³ The distinction between recurring and non-recurring costs suggests that account must be taken of the stage in the compliance process that costs are measured. Costs can be significantly under-estimated if an attempt is made to estimate costs at an early stage in the compliance process at which only non-recurring costs have been borne. Conversely, there is a tendency to overestimate costs if recurring costs decline significantly over time as exporters, for example, learn to adapt to the required controls.

⁴⁴ Pertinent factors can be quite varied and include differences in climatic conditions and disease/pest status, general infrastructure conditions, and the availability of local technical and administrative services.

FIGURE 4.1 COMPLIANCE COST PROFILE



A further distinction can be made between ‘tangible’ and ‘intangible’ costs of compliance (Table 4.1). Tangible costs are easy to isolate and quantify—for example, the costs of establishing laboratory facilities and instituting routine testing programs. Intangible costs are more difficult to identify and quantify. Indeed, in many cases they are only indirectly related to the compliance process. These include the foregone opportunity cost of investments, as exporters curtail new product development or when scarce resources contribute to weakened domestic food safety controls. Most attempts to assess costs of compliance with new standards largely ignore (and may even fail to recognize) these intangible costs, despite evidence suggesting that these may be more significant than the tangible costs (Henson, 1996).

In order to estimate costs of compliance, one needs to isolate these from more general costs created by on-going processes of change. The latter involves evolving food safety and agricultural health controls owing to due pressure from the domestic market or longer-term attempts to enhance capacity in line with international standards. For the individual exporter, compliance efforts need to be teased out from other competitive pressures, some of which may indirectly relate to such standards. This requires that a baseline be established that reflects the way in which food safety or agricultural health controls would be expected to evolve (and thus the non-recurring and recurring costs that would be incurred) in the absence of the new standard.⁴⁵

⁴⁵ In measuring the costs of compliance, mandatory and discretionary actions must be considered. The former are required in order to comply with a specific food safety or agricultural health standard in an export market. The latter are those the public or private entities choose to adopt in the process of compliance. Thus, for example, an exporter may choose to expand the capacity of its processing plant at the time when it is making certain investments needed to enhance food safety controls.

TABLE 4.1 EXAMPLES OF RECURRING AND NON-RECURRING COSTS OF COMPLIANCE

	Tangible	Intangible
Non-recurring	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
Recurring	Costs of collection and analysis of laboratory tests Additional procurement costs for buying 'certified' raw materials Additional overhead costs for implementing HACCP	Reduced flexibility in production processes Reduced enforcement of domestic food safety controls

How efficient are the compliance efforts? The answer is crucial in order to estimate the costs associated with a new food safety or agricultural health standard. An examination of compliance costs across countries and/or individual exporters will reveal very significant differences in both non-recurring and recurring costs. Compliance can often be achieved through various technological and/or administrative ways; some parties may be more efficient than others in this regard. Also, countries and industries have different 'starting points' when more stringent standards are applied. For a mature and reasonably well-developed export industry, new standards may require only incremental changes by exporters, and perhaps modest adjustments in public sector oversight. Where a supply chain is underdeveloped, however, new standards (or better enforcement of existing regulations) may require major upgrades at the enterprise level or the consolidation of certain functions to realize economies of scale.

There is typically also great variation in the efficiency with which compliance is achieved reflecting, for example, abilities to identify and implement needed investments and operating procedures. Although these are themselves important management capacities, they also make it difficult to make generalizations about the magnitude of compliance costs. Should general conclusions be based on some 'average' of estimated costs over countries/firms or based on some concept of an 'efficient' country/firm?

In assessing costs of compliance, the costs of not complying with agri-food standards must also be assessed. The most explicit and direct cost is loss of market sales, owing either to temporary or permanent prohibitions on exports or loss of foreign market buyers. These costs can be significant for supply chains that are highly export-dependent, and more specifically highly dependent on particular export markets. In extreme cases, suppliers may be forced out of the market altogether. More generally, they may take actions to diversify their market base, with which costs will be associated. In turn, these market-based costs will be related to the choice of compliance strategy. For

example, adopting a more defensive position, that implies longer compliance periods, may be associated with greater loss of market sales. If such efforts are unsuccessful, for example in achieving a relaxation of requirements, these costs will not be offset by reductions in costs of compliance; plus there may be a more sustained hit on the reputation of the supplier or country for quality, safety, etc.

4.3 Benefits of Compliance

In addition to the costs, the benefits of compliance should also be identified and quantified.⁴⁶ To date, most commentaries fail even to recognize that benefits exist and thus they overstate the net costs of compliance over the long term. Although this may serve a political purpose for those advocating greater flows of technical assistance, it can also have an adverse impact on policymakers in developing countries, steering them toward more defensive and cost-minimizing strategies rather than examinations of the entire spectrum of strategic options (see Chapter 3).

Perhaps the most significant benefit, and indeed the primary driver in compliance, is continued and better market access. At both the country and individual firm levels (public and private goods, respectively), unhindered access to markets—for example, avoiding border detentions—is a benefit that cannot be overstated. This is especially the case where large investments in compliance-related resources have already been made—resources for which there are limited alternative uses in the short to medium term—making the sunk costs high. Likewise, the benefits from enhanced market access, or from lower costs due to unimpeded access, can be considerable.

As with costs, benefits can be recurring and nonrecurring, tangible and intangible (table 4.2). Many of these benefits are only indirectly associated with the process of complying with a particular standard and thus are largely intangible. Thus, intangible benefits include opportunities to reassess the efficiency of prevailing systems of production more widely, and to study the impact of stricter standards on product quality more broadly. These opportunities may improve reputations and increase customer demand over the short or long term.

The potential *tangible benefits* relate most directly to the impact that better food safety or agricultural health control systems have on costs of production, including less waste, greater productivity, and so forth. Other important tangible benefits may be broader access to markets or particular market segments. Although the focus here is on export-oriented supply chains, spillover benefits also occur, as in farmer productivity or

⁴⁶ Economists would typically focus on the net impact of compliance with standards on social welfare, examining the impact on society as a whole—and perhaps how this is distributed among the different economic groups. The perspective here is partial, however, as it examines particular economic benefits for the actors directly involved in compliance.

consumer health in the domestic market.⁴⁷ These act to offset recurring compliance costs such that the longer-term impacts might result in lower supply costs. These benefits can be augmented if the government and firms innovate in the face of new standards and thus minimize compliance costs. Such so-called regulatory-offset innovation has been shown to be significant if controversial, as in the case of environmental regulations (Porter, 1991; Porter and van Liede, 1995).

TABLE 4.2 EXAMPLES OF RECURRING AND NON-RECURRING BENEFITS OF COMPLIANCE

	Tangible	Intangible
Nonrecurring	Crisis containment, as when the existence of a functioning traceability system prevents an ‘alert’ from becoming a crisis and cause for banning the country as a supplier	Opportunity to examine overall efficacy of controls
Recurring	Access to more remunerative markets and supply chains Reduction in costs due to enhanced efficiency Reduced wastage in production processes Reduced level of product inspection and detention abroad	Enhancement of product quality Enhanced morale of inspection or production staff Improved reputation of firm and/or country

Given that the costs of compliance with new agri-food standards are typically more tangible (and thus more visible) than any benefits and that recurring benefits are typically more significant than shorter-term nonrecurring benefits, compliance is widely perceived to be costly. This produces a perceptual barrier that overstates the overall net cost and drives strategic decisions toward exit, reaction, and defense in an attempt to minimize change. Such approaches are typified by efforts to cut corners and put out fires, and to delay efforts to comply until the very last minute.

The failure to recognize the full extent of any benefits can also lead to the underestimation of rates of return on investments (including both nonrecurring costs and the net present value of recurring costs over some defined period of time into the future). In turn, this can generate a culture of dependency and the tendency to wait for donors to arrive with technical assistance or for the government to act because compliance is

⁴⁷ In industrialized countries, much of the analysis of benefits from environmental or food safety measures focuses on the domestic context, valuing the gains in animal, plant, and/or consumer health. See OECD (2003a) for a review of the methods and findings of such work. When developing country suppliers make investments or adopt certain management systems, they reduce the plant, animal, or human health hazards faced abroad. Hence, many of the tangible benefits from developing country compliance are realized abroad, reinforcing the public good nature of these benefits.

perceived to be costly. As a general rule, however, both donors and national governments are slow to act, often waiting until a crisis develops before taking action. The result is a reliance on reactive strategies, even where prevailing capacity may permit more offensive and proactive responses to be implemented.

BOX 4.1 THE BENEFITS OF VOICE: SOME EXAMPLES FROM THE WTO's SPS COMMITTEE

As noted in Chapter 3, certain developing countries have utilized the system provided by the Sanitary and Phytosanitary Committee to register complaints regarding proposed/applied SPS measures by other members and to take some of these concerns to a higher level of dispute settlement. It is not possible to provide a scorecard on the results of such attempts at voice, given that many of the outcomes are not publicly communicated. Sometimes the matter is resolved between the parties; sometimes not. There are also instances when the original complaint is quietly withdrawn. Still, the information available to the SPS Committee does suggest that developing countries can, probably quite frequently, obtain satisfactory results by bringing their bilateral concerns to the attention of the committee and that of all other WTO members. Some examples of this include:

EC Citrus Canker. Argentina requested bilateral consultations with EC experts on a proposed measure on citrus canker. Several other countries supported Argentina's concerns. The consultations resulted in a revision of the measure which includes the possibility for recognition of equivalent certification systems.

Chile FMD Restrictions. Argentina was concerned about draft regulations on fresh or frozen beef which appeared to be more restrictive than OIE standards in relation to FMD controls. Argentina requested Chile to amend the draft to reflect the OIE code, or to show sufficient scientific grounds not to. Bilateral meetings led to resolution on the matter.

Australia and Sauces Containing Benzoic Acid. The Philippines voiced concern about certain import prohibitions that appeared discriminatory, enabling products from New Zealand to contain this acid yet not similar products from the Philippines. Eventually, the Australian regulations were altered and detentions of the affected Philippine product ceased.

Turkey and Import Procedures for Fresh Fruit. Ecuador initially requested consultations with Turkey regarding certain procedures for handling imported bananas, which were thought inconsistent with obligations under the SPS agreement. A dispute panel was eventually formed and the two parties later reported that a mutually agreed solution was found.

Mexico and Measures Preventing Imports of Black Beans. Nicaragua requested consultations claiming that certain sanitary and phytosanitary measures taken by Mexico were inconsistent with articles of the SPS agreement. Direct negotiations later led Nicaragua to withdraw its request for consultations as the matter had been resolved.

4.4 Measuring the Costs and Benefits of Compliance

The preceding discussion has hinted at the problems associated with attempts to identify and quantify the costs and benefits of compliance with new standards for agricultural and food products in international trade. The key challenge is to identify the actions taken (or required to be taken) in order to achieve compliance and then to quantify the cost and benefits arising from these actions. In so doing, there are potentially *very significant attribution problems*, which in turn relate to the concepts of necessary costs and efficiency in compliance discussed above. In many cases, efforts to achieve compliance

with standards are undertaken within the context of prevailing competitive challenges. Thus, the costs faced by individual enterprises may be very different according to their competitive positioning and historic efforts to improve food safety and agricultural health at the national, industry, and enterprise levels, making it difficult to attribute costs and benefits specifically to a particular standard.

Having defined the actions attributed to a new standard, the next challenge is to quantify the associated costs and/or benefits. In many cases, public authorities and private enterprises are unable to distinguish clearly the precise costs associated with compliance and, even when they can, may not have records of the precise amounts involved. This is particularly a challenge in the case of recurring costs that are less discrete and are liable to change over time according to both internal and external factors. Only as firms grow in size and their management structure becomes more sophisticated is there a possibility that quality assurance and/or food safety systems and personnel are separated out in company cost accounting. Even in large organizations, however, this seems to remain the exception rather than the rule.

There are two main approaches to the estimation of compliance costs and benefits associated with standards: (1) deconstructive; and (2) constructive. Both approaches have their strengths and weaknesses but are each imperfect. On the one hand, most deconstructive approaches rely on an established microeconomic theoretical framework and can be used to estimate the overall economic impact of a standard; they are weak, however, at teasing out the discrete impact of a particular standard. Such approaches can be used to assess firm-level (and also economy-wide) costs/benefits but are not readily applicable to the public sector. Constructive approaches, on the other hand, are better able to attend to the impact of particular standards in both the private and public sectors; they rely, however, on reliable data about the associated costs and benefits.

Deconstructive approaches attempt to identify the net economic cost/benefit of compliance—apart from other influences. Typically, these compare production costs before and after the imposition of a standard, or use simulation methods to estimate production costs in the absence of a standard, through the use of surveys or econometric techniques. For example, a number of general surveys ask firms to isolate out the costs of compliance with the standards they face.⁴⁸

Constructive approaches generally adopt an accounting-based framework that aims first to identify the actions taken by the public and/or private sectors in response to an identified standard and then attach monetary values to the associated resources. In general, such information are elicited from in depth personal interviews with the use of questionnaires.⁴⁹ It is mostly this approach that is employed in the case studies for the current project, as summarized in Box 4.2.

⁴⁸ For example, an OECD (1999) survey of 55 firms in various sectors in the United Kingdom, Germany, Japan, and United States suggests that the additional costs of complying with standards in international markets can be as high as 10 percent.

⁴⁹ For example, Cato and Limas dos Santos (2000) estimate the costs of compliance with EU hygiene standards in the Bangladeshi shrimp processing sector.

BOX 4.2 HOW TO MEASURE COSTS OF COMPLIANCE IN PRACTICE

The current project has attempted to use a pragmatic approach to assessing the costs of compliance with food safety and agricultural health standards that follows through the process by which public authorities and individual private sector firms undertake compliance. Thus, an in-depth questionnaire is employed that leads public and private sector decision-makers through the various stages of compliance:-

- What requirements did exports have to comply with previously or compared with domestic market requirements?
- How have these requirements changed as a result of the new standard being implemented? What changes had to be made to prevailing food safety or agricultural health controls?
- What were the costs of implementing these changes?

In assessing these costs of compliance, a baseline must be clearly defined against which the needed changes are measured. This will depend on the specific nature and history of each exporter. The main scenarios are as follows:

- An established exporter faces a new or revised standard. The enterprise is asked to compare the new and old requirements.
- An established exporter is accessing a new external market. The enterprise is asked to compare the standard for which it must comply in the new market with that prevailing in its prior focal external market(s).
- An enterprise which is a new exporter. It is asked to compare the standards in its focal external markets with those applied in the domestic market.

In each scenario, the enterprise is asked to identify the changes required in order to comply, relative to the baseline, and the associated non-recurring and recurring costs of compliance. Individual enterprises are regarded as case studies. Using certain assumptions, the response from enterprises in each scenario can be extrapolated to provide an estimate of the overall costs of compliance for exporters from a country as a whole.

Problems are frequently encountered that can bias any estimates. It is important to recognize these and appreciate the likely impact on the data collected. Thus:

- Both national governments and the private sector may be reluctant to divulge information on limitations in food safety and agricultural health capacity and standards-related trade problems for fear of exposing their weaknesses to importing countries.
- On the contrary, there may be incentives for national governments and the private sector to exaggerate weaknesses in food safety or agricultural health capacity and standards-related trade problems in view of potential flows of technical assistance.
- Where food safety or agricultural health capacity is very underdeveloped, government officials and/or exporters may be unaware or misunderstand the issues being analyzed and, inadvertently, provide misleading or even incorrect information.

The perspective adopted here focuses on the investments the public sector and exporters make in complying with standards, while ignoring how the costs of these investments are redistributed; that is, who eventually pays? This important issue should be considered alongside the flow of economic benefits from such compliance decisions. Thus, exporters may, for example, be able to pass their costs on to consumers, in foreign and/or domestic markets, through higher prices. The government may choose to defray some of these costs through subsidized loans or subsidies. Although this latter issue is briefly discussed with respect to India, it was beyond the scope of research to assess the eventual locus of the costs within supply chains and the broader economy.

4.5 Evidence on the Costs and Benefits of Compliance from the Case Studies

This section brings together evidence on the costs and benefits of compliance with stricter food safety and agricultural health standards from the case studies, focusing on food safety controls on fish and fishery products and horticultural products and spices, and animal health issues. Each is discussed in turn below:

4.5.1 Fish and Fishery Products

The case studies in the current research, together with results from previous studies, throw some light on the magnitude of the costs of compliance with hygiene and other food-safety requirements set by industrialized country markets; they also reveal the ways in which these vary across source countries and individual exporters. Many fishery product exporting nations have faced the challenge of improving their food safety controls or risk losing access to lucrative markets. As discussed in Chapter 3, different countries and exporters have adopted distinct compliance strategies and, as a result, costs have varied. At the same time, the incremental costs vary depending on the point of departure, for example initial levels of hygiene and food safety controls in fish processing facilities. Indeed, where the recorded costs of compliance are high, hygiene and other food safety controls may not have been upgraded in line with the growth of exports, and action was arguably long overdue.

The variation in costs of compliance is well illustrated by the experiences of Bangladesh and Nicaragua, both of which export shrimp to the United States and the European Union (table 4.3). In the mid-1990s Bangladesh had to make major investments to upgrade fish processing facilities, product testing laboratories, and other areas. This occurred after repeated quality and safety detentions of product entering the United States and a ban in 1997 on shrimp imports to the European Union. The total cost is estimated to have been around US\$18 million, with the subsequent annual costs of maintaining the established food-safety controls pegged at US\$2.4 million. In the case of Nicaragua, between 1997 and 2002, the shrimp industry needed to improve its hygiene controls to comply with modified U.S. fish safety regulations. But because many Nicaraguan factories were relatively new and modern, only modest incremental investments were needed; these were estimated to have cost only US\$560,000, with annual maintenance costs of only US\$290,000.

Although the magnitude of these costs may appear high, at least for Bangladesh, it is quite modest given the benefit of continued access to lucrative U.S. and/or EU markets. Thus, the investments made by the Bangladeshi shrimp-processing sector were equal to 2.3 percent of the total value of shrimp exports over the period 1996–1998. The annual maintenance of HACCP and regulatory systems involved costs equal to only 1.1 percent of exports. And significant tangible benefits were associated with these measures. Bangladesh has substantially increased its shrimp exports to (and market share in) the EU, and the industry is moving toward the production and export of value-added products (Cato and Subasinge, 2004).

TABLE 4.3 COSTS OF COMPLIANCE WITH EXPORT FOOD-SAFETY REQUIREMENTS IN THE BANGLADESHI AND NICARAGUAN SHRIMP-PROCESSING SECTORS (US\$ MILLION)

Costs	Bangladesh (1996–98)	Nicaragua (1997–2002)
Industry facility upgrading	17.55	0.33
Government	0.38	0.14
Training programs	0.07	0.09
Total	18.01	0.56
Annual maintenance of HACCP program	2.43	0.29
Shrimp exports during focal periods	775.00	92.60
Average annual shrimp exports	225.00	23.20
Upgrade/focal year export (percent)	2.3	0.61
Maintenance/annual exports (percent)	1.1	1.26

Source: Cato and Lima dos Santos (2000) and Cato and others (forthcoming).

Compliance with U.S. and EU hygiene standards for fish and fishery products in Kerala: The Indian fish and fishery product sector has faced significant challenges meeting emerging food safety requirements in the United States and the EU. These challenges have been particularly pronounced in Kerala where the industry is more dependent on those markets than the rest of India and is dominated by exports of crustaceans and cephalopods. Historically, these problems mainly related to exports to the United States. Yet by the 1990s the EU's food safety requirements—both with respect to general hygiene controls and limits on antibiotics and both biological and chemical contaminants—emerged as the dominant challenge. In turn, the European Union has undoubtedly become the dominant driving force behind the upgrading of food safety controls within the industry.⁵⁰

Faced with restrictions on exports of fish and fishery products to the European Union in the late 1990s, the Indian government responded rapidly with the imposition of quite onerous requirements intended to demonstrate it was able and willing to comply. Thus, within a matter of months after a rather critical inspection report from the European Commission, India had fully complied with EU requirements and made List I status. Similarly, when residues of antibiotics and bacterial inhibitors were detected in shrimp during 2002, the Indian government swiftly imposed strict controls on antibiotic use. It is evident that these actions meant considerable costs for the processing sector, as is discussed below.

The Export Inspection Council (EIC), the recognized competent authority in India for the regulation of fish exports to the European Union, has implemented a rigorous inspection

⁵⁰ The challenges faced by the fishery product sector reflect the failure to upgrade legislative and other elements of the food safety system across India in line with developments in major export markets. Ironically, the very rigorous food safety controls implemented for agricultural and food exports by the Indian government through the 1980s were allowed to wane as a result of liberalization in the early 1990s. While this existing institutional framework may have enabled the Indian government eventually to bring about changes in food safety controls quite rapidly, it did not prevent exports to the European Union being banned on the grounds of microbiological contamination.

and laboratory testing regime to monitor EU-approved plants. This is done through five regional Export Inspection Authorities (EIAs); in the case of Kerala, this is the EIA Cochin. It is estimated that the cost per plant is around \$6,444 per annum, with the bulk of this associated with the fortnightly testing of product samples. This implies a total annual cost of monitoring EU-approved plants in Kerala of around \$341,000 in 2003-04, and a cost for all of India of around \$876,000. As a proportion of the value of exports to the European Union, however, this is only around 0.3 percent.

The laboratory facilities operated by EIA Cochin were relatively small until the upgrades made to comply with EU requirements in the mid- to late 1990s. An investment of some US\$ 65,000 has been made. However, this laboratory has severe space constraints, and land has been acquired for a new facility that will be built in the next one to two years. The laboratory operated by the Marine Products Export Development Authority (MPEDA) in Cochin has recently installed new HPLC-MS/MS equipment in order to perform laboratory analysis of antibiotics residues, at a cost of around \$280,000.⁵¹

MPEDA has implemented various programs to support improvements in hygienic controls and other food safety practices in the fish processing sector. It operates a subsidy scheme to assist companies to establish quality control laboratories, integrate pre-processing facilities, and undertake other renovations. The subsidies are at the rate of 45 to 50 percent, with a cap placed on the amount per company. The amounts disbursed under this program and the numbers of processing units supported over the period 1996-97 to 2001-02 are summarized in table 4.4.⁵²

To comply with the EU's hygiene standards, India made major investments in processing-facility infrastructure (e.g., flooring, walls, lighting, etc.) and control systems of fish-processing facilities, including the implementation of HACCP. The changes required varied significantly among individual factories. In extreme cases, plants had to be extended or the entire layout was changed, for example, to ensure a unidirectional flow of material in order to prevent cross-contamination between raw and processed materials. Many plants also installed ice-making and laboratory facilities, upgraded water treatment systems and increased chill room capacity. Across virtually all plants, other, less expensive changes had to be made including the installation of air curtains and/or air conditioning, foot baths, new wash basins, and thermographs and the purchase of new utensils, staff uniforms, metal tables, etc.

⁵¹ The ultimate aim is to have nine well-equipped laboratories nationwide, some of which may be operated by other agencies under a Memorandum of Understanding with MPEDA. In addition, there are three private laboratories in Cochin that play an important role in bolstering analytical capacity in the State.

⁵² MPEDA also provides and supports a number of training programs, both in general quality control procedures and HACCP. Over the period 1996-97 to 2001-02, 29,110 fishers, 20,363 pre-processing workers and 15,745 processing workers received basic quality control and hygiene training.

TABLE 4.4 MPEDA SUPPORT FOR FACTORY UPGRADES IN INDIA'S FISH PROCESSING INDUSTRY, 1996–97 TO 2001–02

Year	Support for QC laboratories		In-house preprocessing facilities	
	Units	Cost (US\$)	Units	Cost (US\$)
1996–97	7		4	81,534
1997–98	17	22,435	7	202,269
1998–99	12	13,936	6	159,334
1999–00	18	20,880	24	463,500
2000–01	14	15,576	36	677,050
2001–02	30	31,047	55	876,234
Total	98	103,874	132	2,459,921

Source: MPEDA.

Among the plants surveyed by Henson and others (forthcoming), the nonrecurrent costs of compliance ranged from US\$51,400 to US\$514,300, with a weighted mean of US\$265,492 (by volume of production). As a proportion of company turnover in 1997–1998, these costs ranged from 2.5 percent to 22.5 percent, with a weighted mean of 7.6 percent.⁵³ In 2001 there were 51 EU-approved facilities in Kerala, suggesting an overall nonrecurrent cost across the sector of US\$13,540,092. This represents around 1.7 percent of the value of exports from Cochin over the three years (1994–95 to 1996–97) prior to the initial implementation of these investments. It should be noted that these rather high numbers, to a large extent, reflect the very specific characteristics of the fish-processing sector in Kerala—namely, the historic use of independent pre-processing facilities (see below). From interviews with fish processing companies it is apparent that the installation of integrated preprocessing facilities was the most significant costs of compliance.

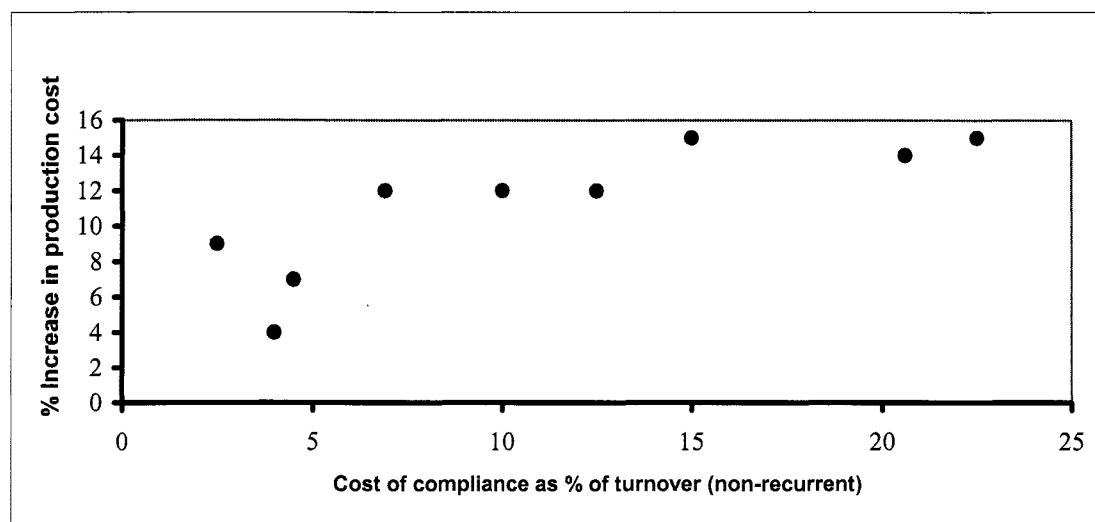
Processing plants also had to implement significant changes to their operational procedures. The majority had not implemented HACCP, and this was required to establish the necessary control procedures and documentation systems. Further, cleaning, maintenance, and pest control procedures had to be enhanced. In many cases, extensive worker training programs had to be undertaken. The cost of implementing these new procedures has been considerable, including laboratory analysis, record-keeping, ongoing staff training, maintenance of worker medical records, and so forth. To undertake these tasks, new technical and supervisory staff had to be employed. Monitoring fees paid to the EIA have also increased significantly. Further, the costs of preprocessing have been internalized within the processing plant; these are significantly greater than purchasing preprocessed raw material from independent facilities. Across the surveyed companies, the resultant increase in production costs ranged from 5 percent to 15 percent, with a weighted mean of 11.7 percent. From the in-depth interviews with fish processors, again

⁵³ This does not include the value of lost production for plants that had to close during renovations. Many plants had to curtail production at some point in the process of upgrading hygiene standards. In cases where major construction work was required, the curtailment extended across several months.

it is apparent that the majority of these costs are associated with the EIC's requirement to have integrated preprocessing.

Figure 4.2 illustrates the diversity of experiences among a selection of nine SMEs within the sector—that is, firms whose annual turnover ranges from \$1.0 to 3.0 million. Some of these firms only had to make incremental changes to obtain compliance, while others had to make large investments relative to their annual turnover. The data also suggest a correlation between investment and recurrent costs. Those firms which had to make comparatively large investments also report relatively large increases in their unit production costs attributable to food safety management measures.⁵⁴ This finding lends support to the earlier argument about the relatively high costs—and effects on competitiveness—associated with reactive and defensive responses to the changing standards environment.

FIGURE 4.2 INDIAN FISH PROCESSING SMEs: NON-RECURRENT AND RECURRENT COSTS IN RELATION TO COMPANY TURNOVER AND UNIT PRODUCTION COSTS



Source: Henson and others (forthcoming)

To date, the level of investment made to comply with the European Union's hygiene standards for fishery products in Kerala has been considerable, amounting to US\$13.5 million. Although this has undoubtedly imposed hardships on many processors, in particular those that were already operating at low levels of capacity, overall it only represents 1.7 percent of the value of exports over the three years prior to the imposition of new controls by the Indian government. Further, for those processors that have managed to comply, the benefits of continued market access are considerable. Indeed, the fact that Indian exporters have not faced the restrictions imposed on their Chinese and

⁵⁴ Several factors could account for this, including the depreciation costs on new equipment, the relative lack of familiarity with this equipment, and overall weaknesses in business management. For whatever combination of reasons, precisely those firms which incurred relatively high non-recurrent compliance costs are also the firms struggling to compete on a cost basis with others.

Thai competitors through 2002 and 2003 may have been a source of competitive advantage related to the European Union's stricter food safety standards.

BOX 4.3 SHRIMP PREPROCESSORS AND SHIFTS IN PROCUREMENT ARRANGEMENTS

A key element of the supply chain for fish and fishery products in Kerala is the preprocessing sector. Traditionally, independent preprocessors sourced raw material from fish boats, which they then cleaned and peeled before selling it to processing plants operated by the exporters. These plants froze and packaged products for export in a cooked or uncooked state. In so doing, they played an essential role in the sourcing of raw materials and in managing the costs of preprocessing operations, which are a significant part of the total cost of processing and which is heavily labor intensive.

The European Commission voiced serious concerns about the hygiene controls for pre-processing. Indeed, the Indian government recognized the considerable control problems associated with separate preprocessing and processing operations. Thus, in 1997-98 the EIC prohibited the use of independent preprocessors in the case of EU-approved facilities. Non-EU-approved processing plants were, however, permitted to continue using independent preprocessors on an interim basis. Thus, EU-approved processing facilities installed their own preprocessing capacity, while independent preprocessors made their own investments to upgrade their facilities to meet these higher hygiene standards.

Fish processors now purchase directly from landing sites through independent agents, paid on commission. Many employ supervisors at landing sites to check quality and prices. However, the final acceptance or rejection of raw materials occurs at the factory. In some cases the factory transports the fish; in others this is the agent's responsibility. Regardless, most processors provide ice produced in their own facility. To the extent possible, many processors attempt to buy from selected fishing boats. However, attempts to have direct contractual links with fishermen have generally failed.

While the costs of these improvements have been significant, a number of processors have highlighted the benefits. Many have recorded lower microbial counts in their end products, contributing not only to food safety but also to lower levels of spoilage. Some recognize that they now have greater control of the entire production process and expect to be able to enhance efficiency in the medium term. With their expanded chill room capacity, processors are able to store raw materials for longer periods, enabling them to take advantage of periodic gluts in supply.

Upgrading of Hygiene Standards in the Nile Perch Sector of Kenya

Over the period 1998–2002 significant efforts were made to improve hygiene standards within Kenya's industrial fish-processing sector in order to comply with EU requirements. This followed a series of negative inspection visits by the European Commission and the imposition of restrictions on exports of Nile perch to the EU, not only from Kenya but also from Tanzania and Uganda. When the Commission again undertook inspections in March 2002, it found that approved facilities generally met the requirements of EU legislation concerning structure, maintenance and hygiene, and Kenya was added to the list of 'approved' countries.

Nonrecurring costs of compliance borne by individual companies differed widely, reflecting the varying standards of hygiene that prevailed within the sector in 1998 (Table 4.5). Thus, one plant made an investment of US\$128,000, while others had only minimal costs. In general, costs were greatest where factories had undergone major structural change in order to improve the general facility and implement effective pest control. These facilities had lower pre-existing standards of hygiene. Further, they were generally housed in older buildings, often converted from some alternative previous use, and/or had severe space constraints.

The total cost of compliance for the fish-processing sector is estimated at US\$557,000. This implies an average cost per plant of just under US\$40,000. Although this is not a large amount given exports valued at US\$33.5 million, considering that six plants are not operational, a significant part of the sector has clearly derived no payoff from this investment. Further, there is no clear relationship between size of fish processing operation and non-recurring costs of compliance; some of the smaller processors incurred costs of the same order of magnitude as the larger ones.

Recurring costs of operating to improved standards of hygiene varied from 5 to 25 percent, with a mode of 15 percent. Such variation is difficult to explain. Differences in scale of operation are likely to influence these costs; the literature on the economics of HACCP suggests significant economies of scale (Unnevehr 2000). Also, there are differences in the efficiency by which different companies have adjusted to new systems of production and control. However, respondents also differed in their ability to identify changes in production costs depending on their accounting procedures and the degree to which written records were maintained of processing operations. Where recurring costs of compliance were identified, these related to additional staff costs—for example, employing an HACCP coordinator and quality-control supervisors, additional laboratory testing, reductions in the rate of production to facilitate effective temperature recording, and greater packaging costs.

BOX 4.4 IMPACT OF FOOD SAFETY STANDARDS ON SHRIMP PRODUCTION COSTS IN THAILAND

The Thai government has made considerable effort to promote ‘good aquaculture practice’ in shrimp production in order for the country to meet external market food safety requirements. Interestingly, our case study suggests that farmers may actually experience a decline in production costs as a result of being forced to adopt stricter food safety controls. The Thai Department of Fisheries has enforced a Code of Conduct for aquaculture production that strictly controls use of antibiotics, encourages practices that prevent the buildup of feed wastes, and promotes the use of non-chemical alternatives, such as herbal preparations and probiotic formulations.

The cost of shrimp production using antibiotics is estimated at US\$1.75/kg. Use of chemical alternatives, increased this cost by around 6 percent to US\$1.85/Kg. However, costs of production with probiotic supplements were actually lower than the conventional system (with antibiotic use) by 33 percent at US\$1.17/kg. If farmers also switched to the disease-resistant Vannamei variety of shrimp, production costs were over 38 percent lower. This suggests that, by being induced to adopt probiotics, aquaculture producers achieved a net benefit beyond any changes in trade volumes or market reputation. This option has higher yields, higher survival rates, greater ease of cultivation, shorter production times, and lower feed costs. The Vannamei shrimp also provides more meat than Black Tiger shrimp and grows to a more homogenous size, which makes grading easier.

There are some disadvantages, however. First, because the larger Black Tiger shrimp commands higher prices, this will generally offset the higher yield from Vannamei, with little net changes in farmer incomes. Second, Vannamei shrimp are raised in more intensive farms which means that more larvae are required per unit area. Finally, Vannamei shrimp face greater competition in international markets—there are more than 30 supplier countries for white shrimp compared to only 10 for Black Tiger shrimp.

Source: Manarungsan and others, forthcoming.

**TABLE 4.5 NON-RECURRING AND RECURRING
COSTS OF COMPLIANCE FOR KENYA'S INDUSTRIAL FISH PROCESSORS**

Plant	Number of permanent/ temporary employees	Value of exports, 2002 (US\$)	Current operating level (percent)	Nonrecurring Costs (US\$)	Increase in unit production costs (percent)
A	75/100	10.73 million	30	26,800	5
B	100/80	1.86 million	40	19,600	10
C	20/40	0.54 million	25	15,200	25
D	150/250	2.59 million	50	13,600	15
E	100/150	0.32 million	50	8,500	15
F	100/200	0.38 million	50	21,800	20
G	270/250	12.83 million	60	128,000	25
H	75/100	4.27 million	50	6,500	15
I	—	0	0	80,000	30
J	—	0	0	200,000	40
K	—	0	0	2,100	40
L	—	0	0	7,100	50
M	—	0	0	19,500	25
N	—	0	0	8,300	40
TOTAL		33.52 million	—	557,000	—
Mean per plant			44	39,785	25

Companies I through N were not operational in early 2003.

Source: Henson and Mitullah (2004).

4.5.2 Horticulture and Spices

Examining compliance costs and benefits in horticulture and spices is frequently a more challenging exercise than in relation to fish or livestock industries. In contrast with these latter cases, where public regulators often govern market access and where distinctive events (for example, a disease outbreak or temporary product ban) present a before and after context, many of the compliance challenges in horticulture and spices have evolved over time and have thus led suppliers to make steady yet incremental changes in their supply chains, testing arrangements, and so on. Some of these changes are motivated by SPS compliance; others by multiple objectives. As a result, analytical attribution problems are commonly encountered. While a number of crisis situations have occurred and are noted in the existing literature, they do not represent the norm in these product fields. In addition, a large part of the compliance challenge for horticultural and spice growers and exporters is in relation to the specifications of individual or groups of private buyers.

Hence, in horticulture and spices, compliance tends to be in relation to a moving and variable target and is normally embedded in wider organizational and technological changes geared toward improving competitiveness. This reality makes it especially difficult to generalize about compliance costs or benefits. As such, the analysis here

provides a somewhat more extended discussion of compliance costs and benefits in two of our case studies, while providing supplemental insights from several other cases.

India Spices: Making a Down Payment on the Future

As noted in Chapter 3, the Indian spice industry has faced, in some of its key external markets, increased scrutiny by buyers and regulators with regard to product quality and microbiological or chemical contamination. Although some changes were made in the industry earlier, the bulk of investment in quality assurance and food safety facilities and systems has occurred over the past decade.⁵⁵ The \$14.5 million invested in standards compliance between 1995/96 and 2002/03 represents approximately 1 percent of the total value of Indian bulk and semi-processed spice exports during this period.⁵⁶

The largest investments have been in various types of cleaning and sterilization equipment and in associated quality assurance management systems. In the Cochin area alone, more than a dozen companies invested in ethylene oxide sterilization facilities costing between \$100,000 and \$300,000. A portion of these costs was covered by the Spices Board as part of an ongoing program to encourage investments in technology upgrading. Many companies also invested in mechanical spice grading, washing, drying, and packaging equipment, again with some subsidy under the Indian government program. In conjunction with these investments, most of the medium-sized and larger companies developed and implemented one or more certified quality-management systems, including HACCP, ISO 9000, and others. Development, implementation, and certification costs ranged from \$2,000 to \$10,000.

Nearly one hundred spice companies now have their own labs, although many of these are rather basic, able to test only for physical and chemical properties. Smaller companies have tended to use the lab testing services of the Spices Board, the capacity of which has been enhanced over the years. Most of the leading companies have expanded their lab capabilities, drawing on a 50 percent grant from the Spices Board for this purpose. Equipping a fully functioning private lab to test for pesticide residues and aflatoxin costs companies from \$50,000 to \$125,000. While previously they may have had one person manning their labs, now most have three to five technicians.⁵⁷

Considerable attention has been given to improving farmer postharvest methods through training and subsidized provision of drying mats and cement drying floors. In 1997–2002, the Spices Board trained 163,000 farmers and provided improved drying mats to some 68,000 farmers. The total budgetary allocations of the Board's Post Harvest Development Scheme were \$800,000 over the period.

⁵⁵ This does not include investments made in the spice oil/oleoresin segment of the industry.

⁵⁶ Total spice exports minus those of spice oils and oleoresins amounted to \$1.433 billion over this period. Most of the investment was in capital equipment.

⁵⁷ The variable costs associated with an expanded battery of lab tests have also been significant. For example, one company estimates the costs associated with testing dry chilies for pesticide residues and aflatoxin to be equivalent to 2.8 percent of the product's FOB value.

**TABLE 4.6 INDIAN INVESTMENTS IN SPICE QUALITY/FOOD SAFETY CAPACITY,
MID-1990S TO 2003 (ESTIMATED, US\$ MILLIONS)**

Investment	Private sector	Public sector
Post-harvest materials, infrastructure, training, etc.	3.00	1.00
Cleaning, processing, and sterilization equipment; management systems	6.00	1.00
Laboratory equipment, personnel, and material costs	2.25	1.25
Subtotal	11.25	3.25
Total	14.50	

Source: Jaffee (forthcoming).

What have been the benefits of farmer, company, and government investments in quality assurance and food safety? Many of the benefits have been subtle and are not reflected in the aggregate level of India's spice exports, in large part because of the enormous influence of broader supply and demand conditions and price fluctuations in international markets. Companies that had upgraded their quality control systems in the early to mid-1990s obtained price premiums on their black pepper sales, even as world prices skyrocketed in the late 1990s. Although these prices have since fallen sharply, and fewer international buyers have been willing to pay a premium for the cleaner Indian product, some exporters have found relatively attractive sales in the domestic market.⁵⁸

Exporters report that it costs them some 25–30 percent more to procure (safer) chilies under contract, considering the price premiums that they must pay to cover yield risk and their own costs for field staff, vehicles, and record-keeping associated with such programs. Their more general efforts to control the procurement of certain crops through more intensive vendor screening, monitoring, and record-keeping also involve more staff time. Many of the overseas buyers of Indian chilies are not yet prepared to pay extra for this more rigorous oversight of the crop. However, some buyers will pay such a premium, as will a limited yet growing number of domestic food manufacturers and others. These measures, taken to manage risks, constitute a sort of reputational insurance policy.⁵⁹

Direct monetary payoffs are not the full picture, however. Several managers indicated that the implementation of one or more quality or safety management systems had provided them with peace of mind, enabling them to sleep better at night. It apparently also increased the confidence of their buyers, especially those in the food manufacturing industry, and the confidence of inspectors; firms with certified management systems reported having reduced frequencies of consignment inspection, associated inspection fees, and other transaction costs.

⁵⁸ Where it is estimated that 25 percent of demand is for a higher quality, cleaned product.

⁵⁹ One would expect some economies of scale and institutional learning to be associated with such production/postharvest oversight, reducing incremental unit costs as this approach becomes widespread. Having more direct exporter contact with farmers may also contribute to improved field and postharvest productivity.

Enhanced laboratory testing capacity has certainly been a contributing factor to a reduced incidence of Indian product rejection abroad, due to microbiological or product contamination factors, although some level of rejection continues, especially for consignments from smaller exporters. Improved testing capacity has enabled firms to meet the more exacting specifications of particular buyers. In some instances it has enabled the industry to challenge certain quality/safety claims or concerns on the part of particular trading partners. While regulatory attention to pesticide residues, aflatoxin, and other forms of product contamination has thus far been stronger in Europe than elsewhere, there is an expectation that both regulatory and private oversight on such matters will increase for other markets. The Indian industry is increasingly confident that it will be prepared for such developments.

In the near term, the economic return from both private and public investments in quality assurance and food safety facilities and systems has probably been quite modest because of prevailing conditions in international markets and the modest level of premium awarded to cleaner and safer spices in the Indian domestic market. However, those investments provide an excellent platform for the future development of the industry. At least among leading firms, there is a growing trend away from bulk spice sales and toward custom-made, value-added, semi-processed products. Indeed, the year 2002/2003 was the first in which India's exports of value-added spice products exceeded those for its whole spices. This trend will continue. Many of the investments in improved product cleaning, processing, and testing are of vital importance in servicing the value-added segments of the international spices market—and of absolute necessity if certain companies are to realize plans to sell consumer-pack and branded products. Thus, much of the payoff from public and private investments in quality and safety assurance systems will be accrued in the near future.

Kenyan Horticulture: High Costs and High Gains at the Top of the Market

As noted in Chapter 3, the leading firms in the Kenyan fresh produce industry have essentially sought 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. It is these firms, and their farmer suppliers, that have borne the brunt of compliance costs—and reaped the bulk of the benefits. Others in the industry, especially an array of smaller-scale exporters, have made only modest adjustments in their operations over the years and have continued to sell into countries and particular market segments (for example, the British ethnic vegetable market) that are substantially less demanding in their SPS-related product and process standards. Some smaller companies have aspired to upgrade their operations to meet supermarket requirements but have lacked the financial resources to do so (see the example in Chapter 5).

The tail-riding strategy, which appears to have been costly yet rewarding for the firms involved, is essential for the industry as a whole, in view of its inability to compete directly on a cost basis with international suppliers who face substantially lower freight costs. Several indications can be provided of the investments and the recurrent expenditures associated with the 'riding the tail' strategy. These have included the

construction of high-care processing facilities, investment in private laboratories, and development of full supply-chain traceability. It would be an exaggeration to call these standards ‘compliance costs’, however, because they combine both the normal costs of developing and running a modern fresh-produce export operation and a subset of expenditures made specifically to conform to private or official standards.

Two categories of companies should be considered. One is the ‘premium supplier’—a regular supplier to supermarkets and other up-market distributors. Most sales are of pre-packed and source-traced produce, with improved packaging and product combinations. A second category is the ‘value-added prepared food operator’, who combines the characteristics of the premium supplier with the addition of a so-called high-care line of ready prepared fruit or vegetable products.

In the Kenyan context, the system of raw material sourcing has generally combined the development and operation of one or more farms to ensure supply control and traceability and the development of tight oversight and procurement systems for small and larger out-growers. For larger companies, the acquisition and development of a 100 hectare horticulture farm costs in the range of \$1.0 to \$1.35 million, including the costs of buildings, irrigation equipment, fencing, and other facilities. Professional management of the farm, involving an experienced general manager, farm manager, a handful of senior supervisors, and several accounts staff, could cost close to \$100,000 per year. To effectively manage a smallholder out-grower system, the company would need a team of field supervisors and assistants, some vehicles, basic collection stations, and many clerks to handle paperwork. One large company, with nearly 200 smallholder out-growers, spends about \$175,000 per year to manage its system. Put another way, the transaction costs of smallholder oversight and traceability, not including the actual prices paid to farmers, are equivalent to about 6 percent of the FOB value of the green beans that the company procures from out-growers.

At the packinghouse level, leading companies have upgraded and expanded their facilities, putting in improved lighting and water sanitation systems, advanced cold treatment and storage systems, facilities for worker hygiene and HACCP, and advanced quality management systems. A small version of this operation, handling 500 to 1,500 tons per year, could entail investments of up to \$1.5 million. A larger version, handling 2,500 tons or more per year, could involve investments exceeding \$4.0 million. The investment in a ‘high-care’ area, involving sophisticated temperature controls and air venting systems, could cost an additional \$0.1 to \$1.0 million, depending on its size and whether or not an entirely new building had to be constructed. Managing such an operation requires a highly trained and experienced technical team. One large company estimates that it spends \$300,000 per year (equal to 3 percent of its turnover) on its quality assurance and food safety operations, including personnel, materials and the health testing of staff.

Yet the benefits from these investments and of general compliance with the requirements of upscale supermarkets also seem to have been significant for individual Kenyan companies and for the industry as a whole. Table 4.7 contrasts the net profit margins

achieved by leading companies for various product lines. Items toward the bottom of the table have required more supply chain control and packinghouse upgrades.

TABLE 4.7 ILLUSTRATIVE NET PROFIT MARGINS FOR LARGER KENYAN EXPORTERS

Product	Typical net profit (percent)
Fine beans, loose in carton	0–2
Okra, loose in carton	2–4
Mangetout in 300 gm bag	4–6
Extra fine beans, top/tail in 200 gm tray	4–6
Garden peas, podded in 200 gm bag	6–8
Runner beans, sliced in 335 gm bag	10–12
Stir fry mix, high-care, 300 gm tray	12–14

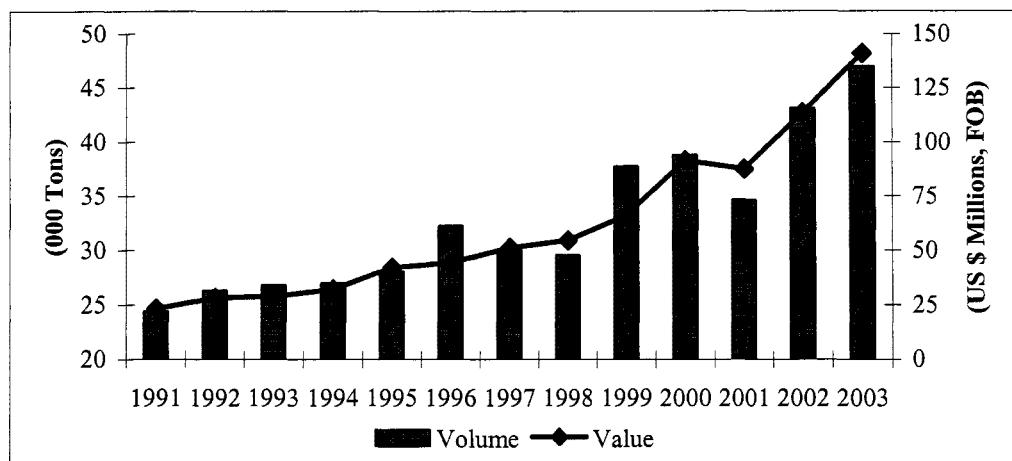
Source: Jaffee (2003).

Higher margins are not the only benefit to have accrued to those who rode the tail of British supermarkets. Other benefits perceived by the exporters include the following:

- Demand is more consistent throughout the year, with little or no seasonality. This helps in negotiating with airfreight carriers.
- A supply program is agreed at the beginning of the year, enabling the exporter to program own-farm and out-grower production.
- The supermarket clients provide detailed information on changing developments and requirements in the market.
- Specifications for quality, hygiene, and other matters tend to include very detailed guidelines to exporters, including examples of good practice.
- A supermarket connection is an excellent marketing tool. The exporter can drop the name of its supermarket clients when talking to prospective customers.

The payoff on proactive investment is illustrated in Figure 4.3. Over the past decade, a period in which EU imports from nonmember countries have been more or less flat, Kenya has been 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 a shift upward in the unit value of its exports.

FIGURE 4.3 GROWTH IN KENYAN EXPORTS OF FRESH VEGETABLES, 1991–2003



Source: Jaffee (2003)

BOX 4.5 COMPLIANCE WITH EUREPGAP: INSIGHTS FROM MOROCCO AND PERU

The EUREPGAP Protocol for Fresh Fruit and Vegetables contains 145 required elements and 65 recommendations, all geared toward encouraging the application of good agricultural practices, reducing chemical applications, protecting the environment, and enhancing worker safety and welfare. A growing number of British, Dutch, Swiss, and Scandinavian supermarkets are requiring their suppliers to be certified for compliance with the EUREPGAP protocol. They may be certified on an individual or group basis, or by having the industry's own quality and safety management system deemed equivalent to that of EUREPGAP. For some suppliers this has been a challenging and costly requirement, because their facilities and production/management practices were far below certain EUREPGAP norms. For others, relatively modest changes have been needed.

In Morocco, several medium-sized and large tomato growers and exporters were required to make substantial investments in facilities and equipment to meet the EUREPGAP requirements (Aloui and Kenny, 2004). Many had lacked storage rooms for pesticides and fertilizers and appropriate changing and washing facilities for farm workers. One farm operating with ten hectares under plastic greenhouses and a workforce of 60 people had to invest some \$50,000 in buildings, facilities, and equipment to become compliant. Taking into account proper depreciation of these investments over time, the firm estimates that measures taken for EUREPGAP compliance account for some 12 percent of its farm production costs and 4 percent of the FOB value of its tomato exports.

In Peru, Galdos (2004) finds that a very large proportion of growers of asparagus, citrus fruit, and avocados are implementing EUREPGAP requirements or are already certified as having done so. The primary motivations or expected outcomes of these farmers are improving customer trust, improving farm management efficiency, and generally improved competitiveness. The most commonly reported constraints in adopting the protocol related to the initial investment costs, absence of waste disposal capacities and services (for example, safe disposal of agro-chemical containers), and complications in training farm workers.

Source: Galdos (2004); Aloui and Kenny (forthcoming)

Costs of Noncompliance: An Illustration from U.S. Importers

Compliance (and noncompliance) costs are incurred not only by developing country suppliers but also by their overseas trading partners. When a consignment of fresh fruits or vegetables is detained by regulatory authorities because of food safety or pest-related problems, importers incur costs (Table 4.8), even if the consignment is eventually

released for onward distribution. The direct costs, including lost value of the product, can be very high, especially for small shipments. In the snow pea example in table 4.8, the direct costs for inspections, laboratory testing, fumigation, and temporary cold storage amount to more than one-third of the CIF value of the consignment.

The indirect costs of the event of noncompliance may range from small to enormous, depending on the nature of the problem, the identity of the supplier, and the extent to which the supply interruption affects downstream customer relations. At least in relation to the U.S. market, an interruption involving a microbiological risk is a much more serious event than one involving pesticide residues. In the former case, the FDA may recall prior consignments from the country or supplier, which could have a major impact on consumer demand for that product and cause sustained damage to the reputation of the exporting country, the supplier, and the importer. Where product detention (or rejection) results in the importer losing an important client the indirect noncompliance costs for the firm involved can be very great.

TABLE 4.8 ILLUSTRATIVE COSTS OF FRUIT AND VEGETABLE SHIPMENTS TO THE UNITED STATES THAT ARE DETAINED BUT LATER RELEASED (US\$)

Element	Cantaloupe	Mango	Red raspberries	Asparagus	Snow peas
Container type	40-ft reefer sea container	40-ft reefer sea container	40 x 48 inch pallet in reefer truck	88 x 125 inch P1P air pallet	88 x 125 inch P1P air pallet
Boxes	840 40-lb cartons	4356 10-lb cardboard boxes	144 flats, each with 12 6-oz clamshells	256 11-lb styrofoam pyramid boxes	300 10-lb cardboard boxes
Winter prices	5.00–12.00	3.00–6.00	12.00–20.00	11.00–22.00	7.00–10.00
Typical price	8.00	4.00	14.00	14.00	7.50
Total value	6,720	17,424	2,016	3,584	2,250
Loss of value (percent)	0–75	0–75	0–75	0–75	0–75
Customs	100	100	60	60	50
USDA inspections	297	297	166	166	166
Lab services	300	300	300	300	300
Fumigation	120	0	0	120	120
Cold storage	210	871	87	154	180
Sorting/repacking	Variable	Variable	Variable	Variable	Variable

Source: Lamb and others (forthcoming)

4.5.3 Meat Products and Animal Health Controls

As with food safety standards, the cost of compliance with sanitary standards can be disaggregated into both nonrecurring and recurring, and tangible and nontangible elements. As most zoosanitary standards deal with the eradication of disease, by

definition an activity with a finite time horizon, the bulk of tangible costs are nonrecurring. Table 4.9 provides an overview of the most common costs incurred in meeting zoosanitary standards. Table 4.10 then provides several estimates of tangible costs that have been incurred by countries in efforts to control animal diseases and obtain or maintain access to major international markets. Comparing different control strategies in the case of a disease outbreak requires a risk assessment approach (including cost and benefit estimates) to identify the most appropriate strategic options.⁶⁰

TABLE 4.9 EXAMPLES OF RECURRING AND NONRECURRING COSTS OF COMPLYING WITH INTERNATIONAL SANITARY STANDARDS

	Tangible	Intangible
Nonrecurring	Stamping out/culling of animals Vaccines and their delivery Quarantine installations (fencing) and related laboratory equipment, investment in traceability	Reduced investment in domestic sanitary control and other areas of production improvement (breeding, nutrition, marketing)
Recurring	Surveillance and early disease alert system Running costs of traceability systems	Underutilization of processing and marketing facilities and related unemployment

Overall, the vaccination approach, consisting of the purchase of vaccine and its administration, combined with movement controls, is clearly the most efficient, with a cost of US\$ 0.75 per animal per vaccination. On the other hand, multiple vaccinations are required for most diseases, and disease-free status with vaccination, in the case of FMD, does not provide access to many markets.

Stamping out, if performed immediately after a disease outbreak, can be very cost-effective. However, this strategy is often affected by late or underreporting, by inadequate or difficult movement control—such as for wildlife—and by other quarantine weaknesses, effects that usually raise the cost of this approach. For example, the 2001 outbreak of FMD in the United Kingdom, diagnosed with some delay and controlled only through stamping out, caused the destruction of about 4.5 million animals. However, in the subsequent outbreak in the Netherlands, which was identified more quickly and controlled through a combination of stamping out and ring vaccination, only 260,000 animals had to be destroyed. Continuous mass vaccination to prevent disease outbreak is a less risky strategy, but for large animal populations, such as in the large countries or regions, and for diseases with multiple pathogen strains, it can be costly and still exclude access to many industrialized country markets.

⁶⁰ One issue in the choice of control strategy is the cost-creep of compliance—the continuing need for investments as standards continue to evolve. The cost of compliance experienced by the beef export sector of Botswana illustrates this point. Botswana benefits from a beef import quota at a preferential price in the European Union. That quota may have justified the original investments to free the country from FMD in the early 1980s and subsequently. Yet, the EU's continual tightening of slaughterhouse standards and recent traceability requirements challenge the wisdom of the original decision to focus on the EU market.

In the context of trade in meat and animal products, the direct and indirect costs of noncompliance may approach or even exceed those directly associated with disease control measures. The most substantial noncompliance costs are typically the declines in trade that attend the loss of access to remunerative markets, and the related need to maintain animals for a longer period or redirect production to less remunerative markets. For example, while the direct costs of Uruguay's FMD disease control measures in 2001–02 were estimated at about \$31 million, the value of the country's beef exports temporarily declined by more than \$150 million, from \$369 to \$217 million.

TABLE 4.10 ILLUSTRATIONS OF TANGIBLE COSTS OF DISEASE CONTROL MEASURES

Country	Intervention	Costs	Remarks
Argentina	Mass vaccination of cattle population following failure of stamping out	Vaccinations cost US\$1.50–2.00 per animal for three vaccinations.	
	Indemnity for culled animals	US\$250 per head of cattle	
Botswana	Indemnity for slaughtered animals	US\$100 million for 320,000 animals	Does not include cost of increased cattle/wildlife fences
Philippines	Mass vaccination to eradicate endemic disease	A total of US\$14 million or about US\$0.50 per animal	
	Strengthening surveillance system	US\$1 million per year or US\$0.50 per animal/year	
Uruguay	Mass vaccination in two provinces	One vaccination, US\$0.65 per animal	Does not include cost of increased monitoring
	Indemnity for culled animals	US\$200 per animal (all species included)	
	Emergency systems	US\$1 million per year or US\$0.10 per animal/year	
Zimbabwe	Mass vaccination in buffer zone every six months	Vaccination costs US\$1.25 per animal	Additional cost of US\$18 million for wildlife fencing
	Strengthening surveillance system	US\$7.6 million per year or US\$0.75 per animal/year	

Note: The data on Argentina, Philippines, Uruguay and Zimbabwe all relate to foot and mouth disease (FMD). The data on Botswana relate to contagious bovine pleuro-pneumonia (CBPP).

Likewise, it is estimated that, following the 2001 outbreak of FMD, the British beef industry lost nearly \$200 million in exports. The government spent nearly \$1.7 billion in compensation for animals destroyed. Agricultural producers experienced a loss of \$260 million associated with having to hold animals for a longer period, plus a loss of \$75 million associated with the sale of animals at discounted prices.⁶¹ The U.K. tourism

⁶¹ Thompson and others, 2002.

industry is estimated to have lost some \$7 billion as a result of the decline in the number of visitors as a direct result of the outbreak.⁶²

Other costs of noncompliance are borne by associated or even non-associated industries. For example, the income of the Argentine meat packing industry was estimated to have declined by some \$40 million per month during the course of the major FMD outbreak in 2000–01. Even the limited outbreak of FMD in the Netherlands that affected only 26 farms and was contained within one month is estimated to have cost \$350 million, largely due to its impact on related sectors (Rweyemamu and Astudillo, 2002).

The High Costs of Disease Control: An Illustration from Argentina

After a major outbreak of FMD in 1990–91, concerted control efforts kept Argentina FMD-free throughout the 1990s. In 1997, the OIE declared Argentina to be FMD-free with vaccination, opening up exports of fresh beef to several previously closed markets, including the United States. By 1999, Argentina stopped vaccinating its cattle herd and was certified by the OIE in early 2000 as FMD-free without vaccination, promising opportunities for high-value niche-market sales in Japan and Korea. Subsequent events, however, dashed those hopes (Rich, forthcoming).

In July 2000, a small outbreak of FMD was recorded in the province of Formosa near the Argentina-Paraguay border. A week later, another outbreak occurred in the province of Entre Ríos, more than 500 km from the previous site. The disease progressed steadily, peaking in late September before slowing by November. Initially, stamping out measures and movement controls were taken. Apparently, the disease was never fully contained in the initial period, and the full severity of its spread was not publicly acknowledged by the government. In December 2000, the disease again gained momentum; by May 2001 more than 150,000 animals per week were being exposed to the virus.

The policy of stamping out and movement controls was ineffective in controlling the disease. In April 2001, the Argentine government began a multi-step program to eradicate the disease. This involved regionalizing the country into five areas. Patagonia was declared to be FMD-free without vaccination, whereas the other four regions were required to vaccinate all cattle stocks. The mass vaccination program was successful in slowing the disease, which by the end of 2001 had essentially run its course; the last outbreak was in January 2002. By the end of the outbreak, nearly 2.8 million animals (roughly 5–6 percent of the national cattle population) had been exposed to the virus. More than 150,000 had become infected, and 875 had died. Approximately 1 percent of all cattle farms were affected.

The direct costs to combat the disease were substantial. The first three rounds of the vaccination program cost \$65 million in 2001 and \$18 million in 2002, all borne by the government. In addition, one source reported that downstream meat packing industries

⁶² The loss of meat exports resulting from a single case of BSE in Canada is estimated at CA\$1 billion, with the loss of live cattle sales (both feeders and breeding stock) estimated at a further CA\$700 million. Thailand's poultry exports are expected to decline from US\$1.2 billion in 2003 to \$480 million in 2004 as a result of the outbreak of Avian flu.

that produced for export were losing an estimated \$40 million per month from idle production. The government assisted the meat packing industry through temporary provision of tax rebates for 20 export-oriented packers. The costs of veterinary services to contain the outbreak are unknown, although likely sizable. Total indirect costs of the outbreak on other sectors of the economy are also unknown. By law, indemnity payments were required to be paid to producers whose animals were slaughtered.

The effects of FMD on livestock markets in Argentina were pronounced, particularly in export markets. Most major export markets for chilled or frozen meat from Argentina, except for Brazil, Hong Kong and African markets, remained closed for most of 2001. The European Union delayed its decision to reopen its market to Argentine beef until November 2001. In the case of fresh beef, the closure of the U.S. market resulted in a reallocation of exports to lower-value markets. Markets such as Canada, Chile, and the United States, which were importing Argentine beef in 1998–2000, had been replaced in 2002 by markets such as Bulgaria and Egypt. In 2003, Argentina was allowed to export precooked, individually quick-frozen meat to the United States, providing a means to add value to exports of processed meat products.

Production effects from the FMD outbreak, by contrast, were negligible, given that only a small fraction of animals were slaughtered or affected by the disease. At the same time, however, there were severe short-term impacts in downstream industries, particularly meat packing. In domestic markets, prices for live animals fell throughout 2001. The real price of steers, for instance, fell from 78 cents per kg in January 2001 to 64 cents per kg in December 2001. However, by the end of 2002, domestic prices had rebounded to levels that were double those of December 2001, aided in part by the devaluation of the Argentine peso.

Numerous steps have been taken in disease control programs since the FMD outbreak. Vaccination has been mandated as the control regime for all animals in Argentina, except in Patagonia. In response to demands from certain export markets, particularly the European Union, a traceability program was implemented to improve animal identification and tracking. Despite these efforts, FMD re-emerged in Argentina in mid-2003, with isolated outbreaks occurring in the northwest of the country near the border with Bolivia. While this outbreak was isolated and contained by stamping out the affected livestock (mainly pigs), the OIE suspended Argentina's designation as FMD-free with vaccination for all regions north of the 42nd parallel in September 2003. Areas to the south of this demarcation are still recognized as FMD-free without vaccination. High-value markets such as the Canada, Japan, Korea, and the United States remain closed for fresh beef. As will be discussed in chapter 5, one of the beneficiaries of Argentina's ongoing problems has been Brazil, whose beef exports have expanded substantially.

4.6 Conclusions

This chapter has explored the costs of responding to food safety and agricultural health standards in international trade. While many forms of technological and organizational change involve shifts in the levels and structures of operating costs, those associated with

changing agri-food standards have proven to be controversial because of perceptions that the required measures are unnecessary or unjustified, or that they yield little or no benefit to those countries and suppliers that make changes. The results of our case studies (supplemented by other research) lead to the following conclusions:

- There are certainly examples of scientifically unjustified standards (and thus ‘unnecessary’ compliance costs), yet this can not be considered the norm. Nearly all of the case studies examined involved legitimate issues of food safety or agricultural health that required better management.
- While less well understood or quantified, there are a broad array of tangible and intangible benefits that accrue to countries and suppliers that improve their food safety and agricultural health management systems, especially those that do so in a proactive manner that yields competitive gains.
- Compliance costs may be significant in absolute terms, but they are often small relative to the value of exports, highlighting the importance of continued market access. Although overall compliance costs (relative to total exports) may not be especially large at the national or industry level, particular firms or supply chains may well face substantial costs. This is especially likely for commodities and exporters for which trading margins are low due to competitive conditions, high operating costs, and other factors.
- It is difficult to generalize about compliance costs. There are many strategic responses to emerging standards and varied technological and administrative ways to achieve the needed food safety or agricultural health results. Different approaches entail different cost structures. Our analysis also highlights the importance of the starting point for compliance. Countries and firms with higher levels of capacity will face lower compliance costs, perhaps because they were proactive in the past in anticipating standards. Further, they are likely to be able to achieve compliance in a shorter period of time, yielding first mover advantages. This finding emphasizes the cumulative nature of capacity-building in this field.
- For these and other reasons, the relative significance of compliance costs varies enormously between different countries, and between industries and firms in the same country. Important variables include the prevailing organizational and geographical structure of the supply chain, the availability of administrative and technical capacities, the level of intra-industry and public-private cooperation, and the strength of existing technical service industries, among other factors. Each of these can be influenced by policy measures and investments.
- Improved food safety and agricultural health is both a national and international public good. Hence, in the context of developing country exports, when suppliers and governments adopt measures to better manage a food or agricultural health risk, foreign consumers and producers benefit. Such benefits normally would not be included in calculations of the economic return on SPS management investment within a developing country.

The costs and benefits associated with compliance (or broader strategic responses) to evolving food safety and agricultural health standards raise some important issues for development agencies and their capacity-building programs. In cases where costs and

benefits are both high, it may be appropriate for agencies to provide technical and financial assistance aimed at achieving compliance, within an overall strategic response to evolving standards. The same response may not be appropriate, however, where costs are high and benefits low. In such cases, agencies might better direct their efforts to enabling clients to refocus exports to alternative markets or products. That said, the distributional consequences of compliance decisions must be taken into account—those consequences are the subject of the next chapter.

CHAPTER 5

THE DISTRIBUTIONAL EFFECTS OF INTERNATIONAL AGRI-FOOD STANDARDS

5.1 Introduction

Any changes in standards for agricultural and food products in international trade inevitably have distributional impacts that reflect the nature of these standards themselves and the strategies employed to achieve compliance. In many cases, these impacts are poorly understood and, indeed, are not even recognized. However, even a cursory assessment of the changes that take place consequent upon compliance with food safety or agricultural health standards illustrates the complex ways in which the costs and benefits are distributed between supply chain participants and within the wider economy.

Although most of the cases presented herein were not designed to study distributional impacts per se, they nevertheless highlight the many ways in which the costs and benefits of compliance have affected different economic agents. The analysis presented in Chapter 3 suggests that recognition of such distributional impacts should be considered, first, while selecting the proper strategic approach to achieve compliance and, second, in assessing the results of such efforts. Further research on distributional impacts is urgently needed; it is hoped that the cursory findings presented below will help to stimulate interest in this area.

5.2 Distributional Impacts of Standards

The introduction of new and/or stricter standards for agricultural and food products in international trade can result in a wide range of primary and secondary distributional effects:

- *At the international level*, via their effect on the relative competitiveness of different countries, given their existing SPS management capacities, climatic/geographical factors, and other factors which influence their ability to comply. Countries that are able to comply at lower cost and/or manage compliance in a manner which yields other productivity gains will gain market share at the expense of others. To the extent that there are economies of scale in compliance, larger countries or larger industries would be expected to gain at the expense of smaller ones.
- *At the industry or primary production levels*, the new standards affect the relative competitiveness of different types of enterprises and farming operations. Where there are economies of scale in compliance, enhanced standards can have a detrimental impact on smaller firms and/or producers (see Crain and Johnson 2001 in the context of environmental standards). But multiple factors may also be involved including the level of preparedness/experience of such players, the breadth of their activities and dependence upon particular markets, the available support infrastructure, and so forth.
- *Within individual supply chains*, distributional impacts are seen, first, in the allocation of compliance-related costs, benefits, and performance risks among supply chain participants and, second, in the likelihood that downstream buyers will choose to

consolidate their supply base in order to minimize transaction costs (see Dolan and Humphrey, 2000) The distribution of costs, benefits and risks will partly derive from where the specific problems lie and the nature of the regulatory requirements. However, positions of relative power within the supply chain are also important in this distribution.

- *Through broader spillover effects in the domestic economy.* For example, domestic consumers may be affected by measures taken for the export market, through the availability, quality/safety, and price of the same products or those which complement or compete with these for resources. Rural residents may be affected by the environmental impacts of proscribed export farming practices. Compliance with standards may impact the broader demand for technical and administrative services.

Specific illustrations of each of these types of distribution effects will be provided in subsequent sections of this Chapter.

In practice, identifying and (to an even greater extent) quantifying the distributional impacts of standards is problematic. In many cases these impacts are subtle and wide-ranging, extending both through and outside of the supply chain directly affected by a particular standard. Further, disentangling the impact of changes in standards from other prevailing changes in the structure of supply chains is often difficult, making it hard to attribute any observed changes to compliance with standards alone. The economic impacts of standards tend to reflect and even exaggerate a country's underlying strengths and weaknesses. There is also a temporal dimension. There may be several rounds of distributional effects as economic agents modify their strategies and particular approaches to standards and as these filter through various product and factor markets.

In practice, the major losers and (to a lesser extent) gainers from new standards are most visible. This has two effects. Firstly, there can be a tendency towards a rather biased perspective on standards that is focused on those who lose, even where there is a net benefit across society as a whole and potentially major pay-offs in terms of economic and social development in the medium or long-term. Such a perspective also downplays the importance of those who gain, even though these may be significant in number. Secondly, it tends to focus attention on major losers/gainers that are easily identifiable, even though the impacts of standards can be dissipated across many groups in society. This is of particular concern where small impacts that largely affect vulnerable groups in society are ignored.

5.3 International Distribution Effects

Concerns about the international distributional effects of rising standards center on the possibility that lower income countries, facing more severe capacity constraints, will experience a decline in their competitiveness and thus be (further) marginalized in the trade in higher value agri-food products. Some literature examines the particular circumstances facing countries in certain regions (i.e. Africa; South Asia) and contends that such countries will be especially affected by new or more strict standards (Otsuki et al. 2001; Jha 2002). The overall evidence on this is rather mixed, with examples of both

low and middle-income countries experiencing significant trade problems and examples of both types of countries being successful in using standards for competitive gain.

Horticulture, Spices, and Nuts

In relation to *horticulture*, a limited number of middle-income countries have long held major shares of particular markets for tropical products or ‘counter-seasonal’ produce. Suitable agro-ecological conditions were combined with investments in production (especially irrigation) and marketing (especially freight logistics) infrastructure to establish and maintain these competitive positions. Very few lower income countries held prominent positions in these markets prior to the 1990s, and the more recent escalation and proliferation of standards. Besides for *certain isolated ‘crisis’ situations* (Box 5.1) *there is little evidence to suggest that new/more stringent standards, as a distinct factor, have had a major impact on the overall level of fresh horticultural exports by low income countries*. In fact, exports of fresh and processed fruits and vegetables from low-income countries experienced an increase from \$1.12 billion in 1990-91 to \$1.95 billion in 2000-01. Thus, their share of world exports in these products increased from 2.0 percent to 2.7 percent (Diop and Jaffee, 2005). The Kenyan experience highlighted here illustrates the possibility for a well-organized industry in a low income country to effectively utilize standards for competitive gain. Many of the SPS-related conflicts on horticultural matters have been between industrialized countries (i.e. US vs. Japan) or between middle-income and industrialized countries (Box 5.2).

In the *spices trade*, there is also little evidence that rising standards is marginalizing low income countries as a group. The somewhat increased attention to food safety and plant health issues in the spices trade since the early-to-mid-90s does not seem to have had any appreciable impact on the overall distribution of trade among developing countries. The same eight countries that accounted for 75-80 percent of developing country exports in 1995 accounted for a similar share in 2002. The shifts in relative shares had more to do with international price movements for particular spices and increased supply capacity in certain countries (i.e. Vietnam and China) than were the result of standards-related effects (Jaffee forthcoming). India is one of the dominant players in international trade in value-added spice products, including oils and oleoresins. It is now seeking to increase its presence in the finished consumer products market.

In relation to *dried fruit and nuts*, Otsuki et al. (2001) draw attention to the potential adverse effects on the exports of Africa arising from the harmonization of EU standards for aflatoxin at a more stringent level than recognized under CODEX. Employing a gravity model, the authors project that African exports to the EU of these products will be hundreds of millions of dollars lower than if the EU had adopted the less stringent CODEX standard. The actual experience since the EU standards came into full force (in April 2002) has been much different than projected. While product rejections due to aflatoxin have indeed increased substantially, the primary countries affected have been Turkey, Brazil, and Iran. The African (including North African) share of the EU market for dried fruit has actually increased as Tunisia and Algeria—both with exceptionally dry climates—experience very low incidence of aflatoxin. A limited number of African (especially South African) consignments of groundnuts have been rejected in recent years

due to aflatoxin, yet in the majority of cases the recorded levels of the toxin have been quite high and would have failed to meet even the CODEX standard. For most African groundnut producers, there have been multiple factors inhibiting their international competitiveness in the confectionery nut market (see Jaffee and Henson 2004).

BOX 5.1 CYCLOSPORA AND THE MIGRATION OF RASPBERRY EXPORT CAPACITY FROM GUATEMALA TO MEXICO

In the late 1980s, several firms began exporting raspberries from Guatemala to the US at times when domestic supplies were limited. By 1996, 85 growers were exporting raspberries valued at \$3 million. However, at this time the US Centers for Disease Control and Prevention (CDC) and Health Canada received reports of some 1,465 cases of food-borne illness associated with the parasite *Cyclospora*. After some time, raspberries from Guatemala were identified as the most likely source of the contamination.

While the US FDA sent a team to Guatemala to investigate, there was much scientific uncertainty and great difficulty identifying the likely source of the contamination. The association representing Guatemalan growers (GBC) remained unconvinced that its raspberries were the source of the problem. It attempted to put in place a limited program to screen out potentially high-risk farms, yet this program had no effective enforcement mechanism. After another large outbreak of *Cyclospora*-related illnesses in the spring of 1997, the GBC voluntarily agreed to stop exports of raspberries to the US. Despite the fact that the Guatemalan government created a food safety commission with certain enforcement powers in late 1997, the FDA was unconvinced and essentially imposed an import ban on Guatemalan raspberries.

Over the subsequent two years many organizations in the US and Canada worked with the Guatemalans to solve the problem. A 'Model Plan of Excellence' (MPE), requiring the application of certain food safety practices by growers, involving mandatory inspection by government and a system for product traceability back to the individual grower was put in place in 1999. Subsequently, the US again permitted imports of Guatemalan raspberries. In 2000, however, there were two further *Cyclospora* outbreaks which were traced back to a single Guatemalan farm, which was subsequently removed from the MPE program. There have been no such outbreaks since.

Facing consumer concerns about the safety of Guatemalan raspberries, several US supermarkets sought alternative sources of supply. Recognizing the enormous challenge in rehabilitating the reputation of Guatemalan raspberries, a number of leading firms in the industry shifted their operations to Mexico. By 2001, there were only four growers of raspberries remaining in Guatemala, with annual exports of less than \$200,000. Yet, Mexico's exports of raspberries grew from \$2.9 million in 1998 to \$8.9 million in 2002.

Although the Guatemalan raspberry industry never recovered, other elements of the fresh produce industry did build upon the institutional capacity-building which took place under the MPE. For example, the Integrated Program for Agricultural and Environmental Protection (PIPA) has been working closely with local blackberry growers, a leading local supermarket chain and others to enhance food safety management systems. The PIPAA is also collaborating with APHIS to expand market access for Guatemalan exports of papayas, greenhouse tomatoes, greenhouse peppers, and avocados.

This case illustrates a number of key issues. First, delays in addressing SPS problems may adversely affect an industry's exports and reputation. Second, an effective traceability system allows trade restrictions to be overcome by particular players, rather than needing to enhance standards in an entire industry. Third, strong grower organizations can improve an industry's ability to respond to SPS challenges. Fourth, small countries and niche products are probably far more vulnerable to loss of markets and reputation in the face of food safety problems than would be the case with larger countries and more mainstream or generic products. Both international buyers and consumers are likely to be more tolerant and patient with core and long-standing suppliers that have established a national image in which they have confidence.

Sources: Calvin (2003); Calvin et al. (2003)

BOX 5.2 INTERNATIONAL (AND NATIONAL) DISTRIBUTION OF BENEFITS FROM MEXICAN EXPORTS OF AVOCADO TO THE UNITED STATES

There has been a longstanding and high profile dispute related to US phytosanitary controls on imports of avocados from Mexico. In 1914, US officials identified avocado seed weevil in Mexican avocados and instituted an import ban. This import ban remained in place through the 1980s despite repeated attempts by the Mexicans to gain market access and on-going dialogue between the Mexican authorities and the US Animal and Plant Health inspection Service (APHIS).

In the 1980s, Mexico expanded its avocado production and improved its production processes. It again sought entry into the US market. In July 1993, APHIS agreed that Hass avocados grown in the State of Michoacan could be imported into Alaska under certain conditions. Trade began and a year later a request was made to gain access to markets in the US northeast. An extended consultation process followed, with growers from California and Florida voicing their concerns about potential adverse effects on the domestic industry should improper quarantine occur. In early 1997, APHIS published a ruling which allowed Mexican Hass avocados to enter 19 states and the District of Columbia.

Imports were permitted from certain growing areas in the state of Michoacan under specified conditions, providing a multiple layer of safeguards at farm, post-harvest, product inspection, and market levels. All stages of the overall system are overseen and supervised by APHIS. Since the lifting of the restrictions, Mexican exports of avocados to the United States have increased significantly, rising from only 367 tons in 1991 to nearly 15,000 tons in 2000. Following a request from the Mexican government, in November 2001, APHIS issued a new rule, extending the number of states to which avocados can be exported to 31 and extending the permitted entry period to six months from October 15 to April 15.

While at a macroeconomic level, there have clearly been significant benefits for Mexico and, more specifically Michoacan, questions have been raised about the impact on local producers. In order to secure access to the US market, Mexican legislation has established a system of phytosanitary control that applies to commercial sales to both international and national markets. Even unregistered orchards are routinely inspected to check on production practices and monitor harvesting methods. Although the government claims that such controls will also be of benefit to producers supplying national markets, this is not yet evident. Stanford (2002) suggests that the benefits of the long-standing and costly political process through which access to US markets was gained has been largely co-opted by an 'elite' of major avocado growers.

Fish and Livestock Products

Food safety standards are an important factor influencing the level and direction of international trade in *fish and fishery products*, and in particular the performance of developing countries. Global trade in fish and fishery products was US\$55.2 billion in 2000. Major exporters include Thailand (US\$4.4 billion) and China (US\$3.7 billion). Collectively, developing countries account for around 50 percent of world exports, compared with only around 35 percent in the mid-1970s. At the same time, industrialized countries account for around 80 percent of global imports of fish and fishery products. Thus, a dominant trade flow is from developing to industrialized countries. This suggests that, while food safety standards are rising, these have not prevented developing countries from capturing an increasing share of global fish exports, albeit this may have occurred at a slower rate than would otherwise have been the case.

Internationally, requirements related to hygiene in fish processing and controls on antibiotics, for example, have favored countries able and willing to make the investments necessary to comply. A good example relates to hygiene requirements for fish and fishery

products in the EU. Only countries for which the European Commission has approved local requirements as being at least equivalent to those in the EU and for which specific import requirements have been established are subject to reduced physical inspection at the border. These are published in Part I of the list of approved countries. Countries for which these procedures have not been completed but where assurances have been given that requirements are at least equivalent to those in the EU are permitted to export on an interim basis, yet with a higher level of border inspections. These are published in Part II of the list of approved countries.

A number of countries, including well-established exporters of fish and fishery products, have struggled to comply with the EU's requirements. Thus, while the number of countries achieving Part I status increased from 27 in April 1997 to 83 in December 2003, 26 remain in Part II and face the possibility of being excluded from EU markets unless they achieve compliance by the end of 2005. *Still, more than half of the Part I countries are low or lower middle-income. As of December 2003, nineteen African countries were on List 1, exceeding the numbers for Asia and Latin America (both with sixteen countries).*

With relation to livestock, the difficulties faced by several South American countries in controlling foot and mouth disease (FMD) have contributed to shifts in competitive positions in the world market for beef. One 'beneficiary' of Argentina's on-going problems (and declining trade) has been Brazil. Brazilian production and exports of beef have exploded in recent years, spurred by technical improvements in production and very effective market promotion efforts. Despite having its own outbreaks of FMD in 2001, the effects on production and exports were minimal as the problem was isolated to a few locations. In 2002, Brazil launched a major investment to register and trace all cattle born in or imported into the country. This should be completed by 2007, with an estimated total cost of \$400 million. Otherwise, the country has taken major steps to harmonize its sanitary arrangements with those of major trading partners. Between 1998 and 2002, Brazilian exports of fresh beef increased from \$277 million to \$776 million, and its combined exports of fresh and processed beef exceeded \$1 billion in 2002. (Rich, forthcoming)

The pattern of low-income countries in livestock trade essentially reflects an inability to meet a broad array of food safety and agricultural health requirements, both pertaining to livestock disease and hygiene controls. Indeed, most low-income countries are restricted to trade in live animals (on the hoof) rather than livestock products, for which attention need not be given to hygienic slaughter in an abattoir, meat inspection and refrigerated transport. Examples include intra-regional trade in West Africa and supplies from East Africa to the countries of the Persian Gulf. *However, even if animal disease and hygiene capacity could be enhanced, these countries would need to compete with well-established livestock product exporters, for example Argentina and Australia, which are more reliable producers with fewer animal health problems and more standardized production* (Upton 2001).

On a more general level, an analysis of U.S. and EU border product rejections related to SPS matters (Jaffee and Henson 2004) does not indicate that low-income countries have been especially affected. The contrary is actually the case. In 2002, a limited number of developing and industrialized countries accounted for the bulk of rejections. Among developing countries, most of the rejections were from countries which have been large/dominant suppliers of ‘sensitive’ products for many years (for example Brazil, Thailand, Mexico and Turkey), or newly emerging large exporters of such products (for example China, Vietnam and India). In that year, five countries, namely China, Thailand, Turkey, Brazil and Vietnam, accounted for nearly 60 percent of EU rejections of agricultural and food product from outside of Europe. These are some of the countries which are simultaneously increasing their EU market share for such products, suggesting that border rejections are more of an irritant than a major problem for larger exporters.

In contrast, in 2002 the EU only rejected 26 consignments from low-income sub-Saharan African countries, with most countries experiencing only one or two such rejections. This reflects the fact that most of these countries are mainly exporting less ‘sensitive’ products in terms of food safety or agricultural health risks, or have been recognized as being fully harmonized with EU requirements for more ‘sensitive’ products (for example fish and fishery products) and thus subject to lower levels of border inspection.

5.4 Industry and Supply Chain Effects

A number of previous studies serve to highlight the distributional impacts of standards within established export supply chains (see for example, Dolan and Humphry 2000; McCulloch and Ota 2002). These tentatively explore the impact on the horizontal and vertical structure of industries including patterns of participation by smallholder farmers and various types of employees. This section extends this analysis, both in horticulture, which is the focus of much of this literature, and into other industries.

Evidence from Horticulture

In relation to horticulture there is concern that more stringent SPS (and other) standards will adversely affect the continued participation of small enterprises and smallholder farmers in export supply chains. SMEs are seen to be disadvantaged given the knowledge-intensity and/or economies of scale associated with certain standards-related functions. Requirements for the application of GAP and for produce traceability might be expected to substantially raise the transaction costs of exporter relations to dispersed, smallholder farmers and thus harm the latter’s relative competitiveness.

The Kenyan experience well illustrates the complexities involved in untangling the distinctive impact of standards on patterns of participation and welfare. Since its establishment in the late 1950s and early 1960s, Kenya’s fresh produce trade has long been dominated by a few companies. By the mid-1980s, the leading six companies accounted for two-thirds of the trade. Taking Kenya’s fresh fruit and vegetable trade as a whole, the level of concentration has not changed from a decade ago. The leading six companies accounted for 75 percent of the volume of exports in 1991 and 71 percent of the total in 2001. Most of the leading companies today were also among the leaders two

decades previously, although the scale and sophistication of their operations have substantially changed.

Also substantially changed is the number of smaller exporters. Through the 1980s, at any one time there were typically more than one hundred licensed exporters, the majority of which were very small and part-time 'brief case' operators. Many of these smaller traders sent periodic consignments to friends or relatives in Europe or the Middle East. Today, there are only about two dozen such companies. Failure rates for such firms have always been high, yet in recent years there has been relatively little new entry into the trade. *Standards have been a contributing yet secondary factor. More important has been the squeeze in profitability for some firms in the face of intensified competition in the market, limited consumer income growth, rising freight costs and periodic adverse movements in relative exchange rates. All of these factors have rendered it difficult to continue to profit from the sale of bulk produce via wholesale markets.*

The leading firms in the Kenyan horticultural export trade have re-oriented their businesses to servicing up-market supermarket chains. About a dozen firms, with varied ownership patterns, are restructuring their operations to service these clients, with a handful providing the leadership. Some smaller firms have been caught in the middle, unable to grow and profit in the more traditional lines of business, yet also unable to make the leap into a larger and more sophisticated operation to service the supermarkets. Limited management capacity has been the constraint for some, yet others have been primarily constrained by lack of financial resources (see Box 5.3).

BOX 5.3 UPGRADING FOR BRC: THE CHALLENGE FOR A SMALLER KENYAN EXPORTER

Most of the companies that have recently obtained British Retail Consortium (BRC) certification have been selling to UK supermarkets for a number of years. They have made relatively large investments in upgrading their pack-house facilities over time, to accompany their overall business expansion. However, there are other firms that presently operate on a small scale, yet recognize that long-term viability may depend upon their ability to service the UK or other supermarkets with value-added product. They are unsure whether they can maintain, let alone grow a business based upon low margin sales of loose produce to clients whose prime concern is competitive pricing.

One such firm is examining the prospects of transitioning toward supplying pre-packed vegetables, necessitating that it put in place the management systems and facilities to conform with BRC standards. This firm presently has annual produce sales of 600 tons, implying a turnover of perhaps \$1.4 million and retained profit in the range of \$40,000 to \$60,000. It recently undertook a feasibility study that determined that the firm would need to invest just under \$150,000 in pack-house modifications and equipment to reach the necessary standard.

Such investment would involve: (1) the installation of temperature control equipment in the packing area (\$40,000); (2) the partitioning of cold rooms to accommodate pre-cooling, cold storage of un-graded produce and storage of graded produce, all entailing new equipment (\$38,000); (3) the installation of produce washing and drying equipment (\$35,000); and (4) the lining of the packing area and cold rooms and ceilings with panels coated with food grade materials (\$19,000). Several other measures would also be required, including the development of an appropriate documentation system. The firm would also need to hire the necessary food technology staff, develop a HACCP system, and develop an effective system of traceability for its produce. This will cost some additional tens of thousands of dollars.

Source: Jaffee (2003)

Regarding the participation of small-holders, it was noted in Chapter 3 that one of the strategies taken by some of the leading exporters in the mid to late-1990s was to acquire or lease their own farms in order to obtain better control over at least part of their supplies. This backward integration was partly stimulated by food safety and/or traceability concerns combined with other factors, including the need for better volume control now that more sales were conducted under fixed seasonal contracts rather than under consignment arrangements with importer/wholesalers, and the ambition to experiment with new products, some of which could not be properly grown by smallholders under Kenyan conditions.⁶³

Earlier research (Jaffee 1990) estimated that in the mid-1980s, upwards of 14,500 smallholders were participating in the fresh produce export system, of which about 7,000 grew various vegetables and 7,500 various fruit for export. At that time, small-holders were believed to account for 45 percent of the volume of export vegetables, and about 65 percent of the volume of export fruit, with combined share of 50 percent. Research undertaken in 2002 (Jaffee 2003) estimated that the smallholder share of vegetable export volume had declined to 27 percent, while their share of fruit exports had increased to some 85 percent. While the number of small-holders growing vegetables for fresh exports has likely declined from a decade ago, those producing avocados and other fruits for exports has increased, probably by a larger amount.⁶⁴

Yet, this is an evolving situation. Firms that were relatively ‘late’ in shifting toward a supermarket focus are at an earlier stage of backward integration, while the firms which had backwardly integrated earlier were finding that certain vegetables could be more cheaply or better produced by small-holders, or that there was too much production/supply risk associated with concentrated production and they are in a process of re-engaging with smallholders and intensifying out-grower systems. How this plays out into the future will depend upon the trajectory of growth in trade in different products and the ability of exporters, working in conjunction with the Kenyan government and various donor-supported programs, to promote the application of GAP among their small-holder suppliers and cost-effectively achieve certification of these out-grower arrangements and produce traceability. Whether or not (smallholder) certification can truly be an effective and sustainable alternative to vertical integration in highly demanding horticultural supply chains is an unanswered question and awaits more experience and testing of different approaches.

Still, in considering poverty reduction issues one needs to place the small-holder participation challenge in a proper context. Some 75 percent of rural Kenyan households produce fruits and vegetables for consumption and sale. This is equivalent to about two

⁶³ For example, runner beans were introduced in the mid-90s and have been a major source of growth. Given the daylight patterns in Kenya, this crop has required artificial lighting to ensure its proper flowering. Garden peas were also introduced. These are extremely temperature sensitive and need to enter and remain in a cold chain very soon after harvest. This logistical factor led exporters to grow this crop on their own farms rather than seek out-growers.

⁶⁴ Growers of mangoes and avocados have been largely unaffected by the changing standards environment. Kenyan mangoes are primarily exported to the Middle East and used to make juice. Kenyan avocados are primarily sold on consignment in wholesale markets.

million households. Twenty percent of these (i.e. about 400,000 households) account for the bulk (i.e. 80 percent) of horticultural sales (Muendo et al. 2004). More than 90 percent of Kenya's vegetable production is consumed in the domestic market. There is certainly more at stake, from a poverty reduction perspective, in the improved efficiency of domestic (and/or regional) fresh produce markets than from the impact which European standards have, or could have, on a few thousand small-holders who produce vegetables for the export market.

McCulloch and Ota (2002) illustrate that small-holder horticultural growers, for export and domestic sales, do have higher overall and farm-based incomes than non-horticultural growers. Still, the number of small-holder farmers involved in export horticultural production pales in significance compare to the numbers of people employed more widely in the sector, including on medium or larger farms, in pack-houses and in associated industries such as packaging, freight forwarding and input supply.⁶⁵ Thus, while the more recent growth of the industry has not been on the basis of expanded small-holder supplies, this does not necessarily detract from the poverty-reducing role of the industry. Larger company-owned and larger out-grower operations are not highly mechanized, the primary exception being land preparation. Although somewhat seasonal, large numbers of jobs have been created on those farms, including for landless or near landless women for whom few other income-earning opportunities exist.

Just as important, the shift from unprepared to semi-prepared produce exports has substantially increased the demand for labor in the pack-houses of the leading companies. Humphrey et al. (2004) suggest that semi-prepared products involve between 2.5 and five times more labor per unit weight than was the case for the unprepared, loose produce. Drawing upon a model of labor demand, they simulated two alternative scenarios. In one, the present patterns of product export growth were used while assuming that the share of smallholder production in that trade would increase (from 20 to 30 percent in their model). In the other scenario, the share of smallholder supplies was held steady, yet it was assumed that future growth in trade in semi-prepared would accelerate faster than its recent trend. The additional labor demand in the latter scenario is many times that of the former, even using the most favorable assumptions for the small-holder case. More evidence is needed from other countries to weigh in on these issues regarding standards, smallholder linkages, and broader employment effects.

Evidence from Spices

India has some 1700 registered spice exporters and more than 300 registered processors of spices and condiments. However, most of these firms are very small or irregular participants in the export trade. The largest 100 companies account for over 80 percent of spice exports, with only the top ten companies being responsible for about half the total trade. Most spice exporters are Indian-owned and are typically family-based companies that have been in this business for several generations, both in the domestic market and through sales abroad. Over the past decade, several major international companies have entered the industry through joint ventures.

⁶⁵ Humphrey et al (2004) estimate that just under 100,000 people are employed in the sector, yet this does not include those employed in associated industries.

The overall trend is toward a growing concentration of India's spice exports. A significant contributing factor has been the changing product composition of India's spice trade. The contraction of its trade in raw black pepper (in which hundreds of smaller firms were active for export) has occurred in parallel with an expanded trade in value-added manufactured products, for which only a handful of very sophisticated firms account for the bulk of sales.⁶⁶ *However, one cannot attribute this increased concentration to the effects of increasingly stringent SPS standards by certain international buyers or importing countries.* Rising standards did not drive the many black pepper traders out of export markets. Rather, they could not compete with Vietnamese supplies on price or simply have found Indian domestic prices more attractive than international prices. Although the quality and cleanliness standards of Vietnamese black pepper is frequently lower than that of India, lower prices have increasingly driven international sourcing patterns.

The application of more rigorous grading, cleaning and sterilization of spices, and a greater array of tests to which products are subjected, have collectively altered the cost structure for some of India's spice export products. In the case of chili powder, for example, the average FOB value for this product was slightly higher in 2003 than in the mid-1990s, yet the raw material composition of the final cost declined both proportionally (from 79 percent to 67 percent) and absolutely (from \$899 to \$804), *suggesting that farmers and intermediary traders have borne a significant part of the incremental costs incurred in cleaning, processing, and testing activity.* The biggest cost increase has occurred for grinding/processing operations, nearly doubling from \$91 to \$168 per ton. The gross margins for exporters of this product remained essentially the same, at about five percent, suggesting that exporters have not made much of a return on their investments in cleaning, processing, and testing equipment. At the same time, however, this investment may have enabled them to service new clients and may have prevented higher levels of product interceptions/rejections abroad.

Evidence from Fisheries

The Kenyan and Keralan case studies illustrate the distributional impacts associated with attempts to comply with stricter hygiene standards for fishery products. These have altered the vertical distribution of costs and benefits as well as induced changes in the horizontal structure and *modus operandi* of the supply chains. The changes have occurred amid wider challenges stemming from over-capacity in the processing sector and both seasonal and structural shortages of raw material. At the same time, Kerala's position in its major export markets was being challenged by new and fiercer competition, notably from China, Thailand and Vietnam. Below we distill the findings from the Kenyan and Keralan cases.

The structure of the Lake Victoria Nile perch sector changed dramatically through the 1980s and 1990s, to become predominantly export-oriented with an industrial processing

⁶⁶ The Spices Board of India indicates the export share of the ten leading companies is 83% for black pepper and 87% for spice oils/oleoresins. In contrast, the trade in chilies and turmeric is more fragmented with the ten leading companies having export shares of 33% and 35%, respectively.

sector supplied by an expanded capture fishery that had remained for the most part artisanal. The imposition of stricter hygiene standards by the EU and the extended periods of trade restrictions induced the Kenyan government to implement more rigorous regulatory oversight and the processing sector to up-grade its facilities. The average level of investment required by each processing plant was not large in relation to the value of exports, but many had been operating at very low levels of capacity such that their profitability was also low. A number of exporters have exited the sector and their facilities have been purchased by a few of the increasingly dominant players. This, in turn, is fueling the consolidation across the processing sector, previously spurred by prevailing competitive conditions.

The implementation of stricter standards of hygiene and HACCP-based process controls in this sector has also had a significant impact on the wider operations of industrial fish processing facilities. Two examples are changes in labor practices and the disposal of waste materials. Historically, most processors have employed predominantly casual labor, particularly in more recent years when the supply of raw fish from Lake Victoria has become more sporadic and processing does not occur every day. However, in response to the need for fish handlers to undergo regular medical checks and be trained in basic hygiene practices, some have increased use of permanent and/or contracted labor. Temporary labor now tends to be used predominantly for tasks that do not involve contact with the fish--for example general cleaning operations.

Given that fish fillets are only 35 to 40 percent of the raw fish by weight, the volume of waste materials produced by industrial processing operations is considerable. The more rigorous standards of hygiene under which facilities now operate require that this material is disposed of both quickly and reliably to avoid any risk of cross-contamination of the raw fish. Many processors have traditionally supplied these materials to artisanal fish processing operations situated in close proximity to their factory. However, these are not able to absorb the supply of frames and other materials the entire year round. Processors are therefore increasingly dealing with traders that collect in bulk and supply industrial fish meal plants.

Structural changes have also taken place in the Keralan fish processing industry, in large part due to the challenges of meeting EU hygiene standards. Many processors were operating at levels significantly below their installed capacity and have struggled to fund the required up-grades to their facilities. A number subsequently exited the sector, while others are still struggling to survive. Increasingly, the sector is being dominated by a relatively small number of larger processors that operate multiple plants. Even more profound have been the structural changes within the pre-processing segment of the industry. Attempts to upgrade standards of hygiene in pre-processing date back to the 1970s. While some fish processing plants integrated pre-processing into their own facilities, independent pre-processing remained the norm until the mid to late 1990s when strict controls were imposed on the sector, effectively preventing the use of independent pre-processors in the case of exports to the EU and, more recently, other countries as well. As a result of these measures, the structure of the independent pre-processing sector has changed dramatically. While the number of pre-processing facilities declined 57 per

cent over the period 1997-98 to 2003-04, installed capacity actually increased 42 percent from 2,700 tons per day to 3,860 tons per day. Thus, the main impact of the regulation of the sector was to force the closure of old and established pre-processing facilities, while new or up-graded (and typically larger) facilities took their place.

Alongside the structural change in the sector, labor practices have also shifted. Traditionally, workers were employed on a piece-rate or temporary basis; peeling was sub-contracted out to home peelers. Firms are now increasing their reliance on casual and part-time workers, most of whom are women that live in the vicinity of the facility. These are chosen on a daily basis from amongst a pool of workers that have undergone the required medical checks and have a health card. Home peeling has been all but stamped-out. During idle times, workers will either remain in the changing /rest rooms at the facility or return home. It is evident that overall levels of employment have declined, whilst certain vulnerable groups have been excluded altogether--for example, poor Muslim women who are culturally barred from taking work outside of the home.

In both the Kenyan and Keralan cases, the wild capture fishery segment had been largely unchanged by the imposition of stricter hygiene standards. Indeed, one of the major remaining challenges is the upgrading of handling practices post-capture and the installation of more hygienic facilities at landing sites. To this extent, the imposition of stricter hygiene standards has had only limited impacts on fishers at the current time. However, in both cases fundamental changes are planned. In Kenya, only 10 out of 297 landing beaches have been designated for improvement and will be approved for export. In Kerala, plans have been formulated for new landing facilities that will be exclusively for export and linked with processing plants. The implications for fisherfolk that are not able to access these new sites are likely to be profound.

5.5 Broader Spillover Impacts on the Domestic Economy

In developing countries, the poor can be impacted by trade-related SPS measures as (1) consumers, (2) farmers, (3) workers/employees, and (4) micro/small entrepreneurs. Impacts can be channeled through the markets for products, labor, and other factors of production (i.e. land, water) and can be positive or negative; substantial or quite minor. The degree or extent of impact depends upon an array of initial conditions as well as the particular strategies and policies which are adopted to address the challenge and opportunities of international agri-food standards. The potentially broad range of domestic spillover effects from SPS-related trade barriers is well illustrated by the case of Ethiopia, which has faced a ban on livestock animal exports to the Persian Gulf countries.

Ethiopia's Somali region is a vast and under-developed lowland area with ethnic and economic links with neighboring Somalia, where livestock production is central to the economy. The mainly pastoral population depends heavily on livestock exports to Somalia for their livelihoods. Most of these exports are re-exported to Saudi Arabia and other Gulf States. The bulk of this trade occurs informally and is not recorded in official trade statistics.

This trade continued for many years, until an outbreak of Rift Valley fever (RVF) in the Horn of Africa prompted Saudi Arabian authorities to issue two consecutive bans, in 1998 and 2000, on live animals and meat from Ethiopia. The ban had a major impact on this economy. Livestock exports had transformed the Ethiopian Somali pastoralist society from near subsistence to being more market-oriented. This shift brought cash earnings and enabled access to food and other consumption goods from abroad. Indeed, economic links with other Ethiopian regions are negligible compared with the illegal exports of live animals and imports of consumption goods from the Arab countries.

To measure the cost and distributional impact of this ban, a Social Accounting Matrix (SAM) patterned on the Somali region economy was used with a CGE model, simulating a reduction of live animal exports from the region equivalent to a 16-month ban. Complementing the CGE analysis was a survey-based analysis of the links among agents in the livestock production/marketing chain-- pastoralists and agro-pastoralists, exporters, transporters, retailers and households. Information on patterns related to production, transhumance, market activity, food security, social life and the environmental were collected through a focused survey of stakeholders. Among the prominent results of this analysis are the following:

In the short-run (four months after the ban), the ban caused a sharp reduction in livestock prices, directly affecting households and the activities most dependent on livestock sales. Hence, small pastoralists and traders experienced comparatively very sharp declines in their incomes and overall welfare. Larger pastoralists could increase home consumption of their own production and/or sales of livestock to compensate for their income loss.

In the medium-run (twelve months), producers had begun to reallocate resources among their different income-producing activities, reducing the supply of livestock and transport services and increasing the supply of milk and grains. This shift produced a partial price recovery for livestock and transport and pushed grain and milk prices down, negatively impacting on sedentary farmers and agro-pastoralists, who had been less affected by the ban in the short-run. In this way, pastoralists and traders, in effect, shifted part of the costs to other agents through markets and prices.

To further compensate for income losses, pastoralists developed various strategies, including taking animals to better grazing areas and traveling to different local markets in their zone as well as across the Somalia border in search of higher prices. To cope with the joint stresses of the ban and a sustained drought, pastoralists also began to cultivate grain and cash crops. Some traders have relinquished business activities, while others have diversified their trading. A number have shifted to non-livestock goods (for example contraband and *chat*, an addictive stimulant), or traded other species of animals; most rely more on local livestock trade (for example to restaurants). Since animal prices were low, this might have allowed the restaurant business to reduce costs, buffering to some degree the loss of business.

Other agents also suffered from the ban. Most brokers lost income because there were fewer transactions in livestock markets. Market administrators reported that the ban had

decreased government's revenue from tax collection. Grain retailers had a reduction in business due to the lower incomes of the other sectors, the drought and the subsequent supply of food aid. Clothes retailers reported that they experienced sizable income losses because their customers lost purchasing power.

Hence, the ban on livestock exports appears to have had significant and widespread ripple effects on the economy of Ethiopia's Somali Region. Some of the adverse effects were felt within the livestock supply chain, while others extended into the broader economy. For example, of the total estimated decline in regional income, some 10 percent of the loss was attributed to 'poor' producers, 23 percent to 'middle-income' producers, 18 percent to 'better off' producers, with the remaining 49 percent involving income losses by those engaged in general trade, retail or other services.

BOX 5.4 SIMULATION OF EXPORT CERTIFICATION SCHEME

A program involving the certification of exported live animals from a potential RVF non-free zone in Ethiopia was evaluated using cost-benefit analysis. The "benefit", as defined in the analysis, were the costs resulting from the imposition of the ban that would have been avoided if the program was in place. Ethiopia was assumed to have RVF non-free status and, according to OIE regulations, animal exports are allowed only with a certification scheme, with or without vaccination. In the non-vaccination scheme, the animals are kept in a collection ground for 30 days. Of the animals to be exported, 1 to 5 percent are tested. After this period, the animals are quarantined for another 30 days prior to shipment, and a second round of sampling and testing is done. For the vaccination scheme, the animals spend 30 days in the collection ground where they are vaccinated. The animals then are quarantined for another 30 days. No testing is needed. Both alternatives require the same basic investments and costs, except for the cost of testing in the non-vaccination case, and the cost of vaccine for the vaccination case.

The results of the benefit-cost analysis suggest that the implementation of an animal health program in the Somali region is feasible and would benefit producers. The resulting costs and the risks of the program are manageable. Different alternatives to finance the program (for example through an export tax, sales tax or increased private transaction/marketing costs) were analyzed to evaluate the effects on the competitiveness, welfare and income of Somali producers.

Looking at the distribution of benefits and costs of the alternative policies, the most significant negative effects for poor households came from an increase in marketing costs or from the imposition of an export tax, via loss of export competitiveness. The sales tax scenario resulted in welfare gains for the poor. Better-off and middle-income producers were more adversely affected than poor producers in all three policy scenarios. The analysis suggests that increasing taxes on livestock sales offers the best prospect to implement a health certification plan in the Somali region. This option has the least negative impact on exports and welfare; while having greater benefits for the poor through transfers from better-off producers. The sales tax policy would benefit pastoralists and traders and affect sedentary farmers and agro-pastoralists negatively, although the total amount of the loss is expected to be small.

The results show that poor producers and the trading and service sectors are not expected to lose from the implementation of the health program. Middle-income and better-off livestock producers are expected to lose on average, but these losses are only a small fraction of their total income. Further, it is very likely that these losses would be compensated by benefits from growth not considered in the analysis.

Measuring the cost of the ban is the first step to determine if there is justification to comply with the costs of developing an animal health program that would allow a regular export flow between the Somali region and the Gulf countries. If this is the case, there could be opportunities to "formalize" this informal economy, contributing to its integration into the rest of the economy. It could also provide opportunities for the Government of Ethiopia to play a central role in the development and the stabilization of an insecure region, while sharing the benefits of growing exports of live animals and livestock products.

Source: Pratt and others (forthcoming)

5.6 Conclusions

International compliance with new food safety and agricultural health standards can bring costs and structural changes which, in turn, can give rise to significant redistribution of welfare across countries, along supply chains affected by standards, as well as within societies as a whole. These distributional effects can come through direct changes in product, labor, and land markets and through various secondary effects (in public health, for example, or in local environmental conditions). The available evidence on this issue in developing countries remains fragmentary, and, there are significant methodological challenges to properly attributing distributional effects to standards *per se*. Yet, several tentative conclusions can nevertheless be drawn from the current research and other complimentary analyses. For example:

- Developing countries as a group are not suffering from a tightening of SPS standards. Yet, differential approaches to the challenge as well as some countries' technical or administrative problems with compliance are affecting the relative competitiveness in international high-value food markets. In general, incremental advantage tends to be skewed to larger, incumbent suppliers, who can realize economies of scale, have better access to information and benefit from well-established reputations with, for example, overseas inspectors. Still, effective action can make a difference. There are examples of well-organized industries (in addition to well managed firms and supply chains) in low-income countries that have maintained or increased their competitiveness and market share following the imposition of more stringent standards.
- While standards compliance (or non-compliance) can bring about changes that harm the livelihoods of the poor, advantages may accrue to those able to participate in evolving supply chains. This can certainly apply to smallholders, especially those operating in suitable locations with adequate infrastructure and in the context of effective producer organizations and long-term relationships with buyers. Smallholder farmers can frequently adopt the necessary technical measures and investments to comply with emerging standards. A key challenge is thus to reduce, through collective action, the transaction costs associated with monitoring and certifying compliance. Public policy and investment can make a difference in the pattern of 'winners' and 'losers'.
- The distribution of compliance costs will reflect strategic decisions on the part of both the public and private sectors regarding compliance. For example, the government can reduce the detrimental impacts on supply chains by investing in public sector capacity (for example testing laboratories), and/or by providing financial and technical support to the compliance efforts of the private sector. Such initiatives can be focused on assisting certain vulnerable groups, such as smallholder farmers, to remain viable participants in export supply chains or tailored to facilitate their switch to alternative market orientations and/or sources of livelihood. The public sector can recover some or all of these costs through user fees. More generally, policy-makers need to be aware of the manner in which the costs and benefits of standards

compliance are distributed and consider compensating actions that can be taken to protect vulnerable groups.

- The rising demand for product quality and safety appears to be giving rise to increased off-farm employment opportunities, especially in product cleaning, handling, processing, and packing and in a broad array of process controls. The terms and conditions of this employment in the formal supply chains, although not optimal, are almost certainly better than in the informal sector, in part owing to the imposition of higher social standards by foreign buyers. Thus, when assessing distributional effects it is important to consider changes in the demand and remuneration of labor in farming, processing, and administrative activities.
- Compliance with SPS standards is only one of many factors affecting competitiveness and only one of many variables impacting the incomes, employment opportunities, and overall welfare of the poor in developing countries. Standards have had distributional and equity effects; these need to be better understood. Yet there is little reason to believe that these effects are somehow unique to standards or more profound than those created by broader market or policy shifts.

The distributional impacts associated with strategic responses to standards also raise a number of challenges for the World Bank. On the one hand, it needs to focus its attention on backing the ‘winners’, countries and exporters that stand to gain from compliance, especially where major investments are involved. On the other, it must support efforts to offset the impact on those who may potentially lose, most notably poor and vulnerable producers, and smaller trader/processors. At the same time, it should encourage the implementation of strategic approaches to standards that provide an acceptable trade-off between the competitive gains to be had from compliance and any negative distributional impacts on the disadvantaged groups. In turn, this requires that the distributional implications of capacity-building and related activities are both recognized and assessed when applying a strategic lens to standards-related issues.

CHAPTER 6

TRADE-RELATED SPS CAPACITY BUILDING: TAKING STOCK AND DRAWING LESSONS FROM RECENT DONOR-ASSISTED PROJECTS

A main message from the foregoing discussion has been that while developing countries have limited influence over the setting of many internationally-recognized standards, they do have room for maneuver in designing policies and strategies to ensure compliance with these requirements in a bid to maintain international market access and enhance competitiveness. In formulating and implementing these policies and strategies, developing countries are seeking additional external assistance as called for under the SPS Agreement. Over the past decade many development agencies have therefore initiated projects or programs to strengthen developing country capacities to implement SPS measures. That capacity-building has ranged from short-term technical assistance and training to more elaborate programs and projects to strengthen marketing and export infrastructure, both in terms of physical assets (for example cold stores and laboratories) and knowledge and management systems. This chapter highlights some emerging patterns in this assistance⁶⁷ and draws some tentative lessons based upon a desk review of selected projects and problems.⁶⁸

6.1 Scope and Scale of Assistance

The most comprehensive database on capacity building in relation to SPS measures has been compiled by the WTO. That database covers projects implemented between 2001 and 2003, including information on the type and level of assistance, participating donor, recipient, and time period of pertinent projects. While the database is incomplete in its coverage and provides only limited detail on most of the listed projects, it does contain sufficient information to develop a broad perspective on emerging donor assistance in this area, especially where this is supplemented by more detailed information about projects/programs obtained directly from the leading donor agencies.⁶⁹ To draw some broad observations, the reported projects launched in 2002, and involving more than a one-time event, were examined. Various agencies and project managers were contacted to develop estimates of project funding that were not reported in the database. This was especially the case for World Bank projects and those of Aus Aid.

⁶⁷ The SPS Committee has produced a taxonomy that is being employed to monitor the technical assistance being provided by WTO Members. However, this essentially represents a ‘record’ of assistance rather than an attempt to coordinate responses to requests for technical assistance from developing countries. Thus far, there has been no attempt to compare and contrast the assistance that has been provided in terms of its efficacy, efficiency, and sustainability in addressing the needs of developing countries.

⁶⁸ A review was done of some 31 current or recently completed projects supported by one or more of the following agencies: the World Bank, the Inter-American Development Bank, the FAO, UNIDO, USAID/USDA, the European Union, and Aus Aid. See Sewadeh and Ferrer (2004).

⁶⁹ However, one needs to crowd out the great deal of ‘noise’ which exists on the WTO database given that it includes literally hundreds of very small one-time events (i.e. seminars, brief consultancies, study tours). As of early 2004, there were nearly 500 ‘projects’ listed in the database, only a small proportion of which have involved sustained and substantial capacity-building support.

Overall Scope

The overall level of funding commitment of the projects in our 2002 sample was US\$ 53 million, with the US and EU being the largest individual donors. However, this figure underestimates the total assistance in this area, as capacity-building support efforts by some donors, including the World Bank, were not included in the database and apparently not all projects of other donors were covered. Moreover, SPS capacity-building is often subsumed within cross-cutting trade capacity-building efforts, without specific cost allocation. In 2002, there were no new World Bank projects that became effective that had clearly discernible trade-related SPS capacity components, yet an array of existing projects involved an estimated combined disbursement of \$5.25 million for SPS capacity-building in that year. A major Australian program involved some \$15 million in expenditures over the 2002-2003 period. Taking these factors into consideration and assuming further under-reporting of small and medium-sized assistance programs, a conservative estimate of recent annual donor/industrialized country government agency expenditures on SPS capacity-building programs in low and middle-income countries would be in the order of \$75 to 80 million per year.

Timing/Catalyst for Intervention

Most donor resources for SPS capacity support have been driven by tension or emergency—in the context of actual trade disruptions or disputes, a threat of such an event, or the perception that certain countries or market participants (for example small-scale farmers) will encounter major problems in trying to comply with new standards. Frequently, SPS capacity needs ‘get on the radar screen’ only in the midst of a crisis, such as when repeated shipments of product have been detained or refused entry by a major trading partner or when audit/inspection teams from the importing countries find unsatisfactory conditions and practices in a growing export sector. Sometimes, the trigger point is not an actual crisis, but a growing recognition of future risk given the experiences of other countries selling similar products into similar markets. For donor agencies, it is apparently easier to justify investments in this field when there are evident risks of trade disruptions or disputes. The demand for assistance almost always increases when there exists a ‘clear and present danger’.

Geographical Focus

A large proportion of the assistance in this field by bilateral donors is driven by ‘self interest’ or domestic considerations such as ensuring that food imports are safe and preventing the spread of actionable plant pests or animal diseases from their main trading partners in the developing world. Hence, throughout the years, various United States agencies (including USAID, USDA, and FDA) have been most extensively involved in programs in Central America, the Caribbean, and elsewhere in Latin America.⁷⁰. The bulk of EU assistance has been targeted at ACP countries and Eastern Europe. Australian assistance has been primarily targeted to the developing country members of the Asia Pacific Economic Cooperation zone (APEC). AusAid’s assistance has primarily focused

⁷⁰ There are on-going efforts to develop a US government assistance strategy for SPS capacity-building in sub-Saharan Africa, partly in response to concerns that African countries have been unable to boost their agricultural exports to the US, despite preferential market access under the African Growth and Opportunity Act, partly because of SPS-related constraints.

on building capacities in plant health and quarantine requirements given Australia's particular concerns in these areas. Projects supported by multilateral agencies are generally driven more by the requests of the recipient countries in whatever region. The vast majority of projects supported by the multilateral agencies are focused on specific countries, while the programs of the bilateral agencies involve a combination of individual and multi-country/regional projects.

With much of the support in this field driven by a combination of self interest and emergencies, there is little application of economic analysis, either involving *ex ante* assessment of the potential costs and benefits associated with alternative approaches, or *ex post* review of the impact and cost effectiveness of adopted measures. Sustainability of project outcomes is also often neglected. In most projects that were reviewed, the participating partners seemed focused on 'putting out fires', devoting far less attention to ensuring that the capacities and functions addressed during the project were sustainable beyond the life of the project. And, in most of these projects, the primary measure of project success was whether the intervention helped the recipient country overcome or evade a trade-related crisis in the short run.

Programmatic Context

A large majority of projects in this field are stand-alone interventions related to SPS capacities, albeit typically involving more than one type of component. Thus, interventions are targeted at resolving particular types of constraints in the SPS-related area. The World Bank's approach has generally differed. With only a few exceptions (for example some animal health and disease control projects in Latin America), most assistance in recent years has been through quality/safety sub-components of larger projects dealing with agricultural services, export promotion, smallholder commercialization, or industry-specific development. Several recent projects supported by USAID or the EU have also featured a broader set of interventions to promote trade and/or agricultural commercialization.⁷¹ There are some apparent trade-offs here. Devoting specific attention to SPS constraints and capacity needs prevents these issues from taking on a secondary status within more complex projects. However, the competitiveness challenges of developing country industries are rarely related to SPS matters alone and, as long as other constraints remain unattended, simply fixing the SPS constraint will not provide a sustainable impact.

Project Size

There is significant variation in the resource commitments to SPS capacity building among the range of projects listed and also observed in our project review. For technical agencies such as the FAO and UNIDO, the typical size of an intervention is in the range of \$400,000 to \$600,000, mostly spent on training and consultancy. The larger thematic programs are mainly funded by the European Union, including its 28 million Euro Pesticides Initiative Program and its 45 million Euro program to strengthening fishery products health conditions in ACP/OCT countries. These provide support to multiple

⁷¹ For example, several projects supported by the EU have addressed broader capacity-building needs related to standards and conformity assessment, cutting across SPS issues, quality control, and matters covered under the WTO TBT Agreement.

countries, with the level of support to any individual country ranging from a few hundred thousand to a few million Euros. There is an enormously wide range of resource commitments to this field within the World Bank's project portfolio. While in most projects, the SPS sub-components involve commitments of between a few hundred thousand and a few million dollars (out of total project sizes ranging from \$5 to 15 million, including other components), one coastal resource management project in China involves some \$19.5 million in food safety-related investments over an eight year time period (within a broader project involving a loan of \$100 million). There are three new projects—in the Philippines, Romania, and Kazakhstan—that will each involve World Bank loan commitments exceeding \$10 million for food safety and agricultural health components. Projects with relatively large resource commitments typically involve investment in marketing, research, and/or testing infrastructure and equipment.

Sectoral Focus

While some projects are geared toward building horizontal capacities and reforming broad food safety or animal/plant health regulations, many (including most of the larger projects in this field) have provided support for capacity enhancement in specific industries. The most common are the fishery, livestock, and horticultural export sub-sectors. Given the greater incidence of SPS-related trade constraints, disputes, and emergencies in these commodity fields, this seems appropriate.

Limited Collaboration Among Agencies

This review suggests that in this relatively young field there has been rather limited cooperation between bilateral and multilateral agencies and between “technical” donor agencies--such as FAO, WHO and UNIDO-- and “financing” donor agencies such as the World Bank. With the exception of the USAID and the Animal and Plant Health Inspection Service (APHIS) of USDA, there are few projects where technical and financing donor agencies provided joint support in SPS capacity-building. The lack of collaboration between bilateral and multilateral agencies may be explained by the need of some of the bilateral agencies to have trade partner regulations and/or institutional arrangements that specifically meet their own product/process standards. It is more difficult to account for the seemingly limited collaboration between the various multilateral agencies, especially when considering their potentially complimentary roles in the capacity-building process. It is such a consideration that has led to the establishment of the Standards and Trade Development Facility (STDF).⁷²

6.2 Targeting the Public Sector, Private Sector, or Both?

Traditionally, SPS Management has been perceived as a predominantly public sector responsibility. Indeed, there are important regulatory, surveillance and management functions that are necessarily carried out by government agencies. For example, some importing countries require a designated public sector ‘competent authority’ to carry out certain enforcement functions. However, the private sector has a fundamentally important

⁷² The STDF brings together the WTO, FAO, WHO, OIE, and the World Bank into a partnership for information-sharing and support for capacity-building in developing countries.

role to play in the development and sustainability of food safety and agricultural health management capacity. This can complement, or may even substitute for the development of public sector capacity. An example is investment in laboratory testing facilities. In a number of developing countries with insufficient public sector capacity to meet requirements in export markets, the private sector has established its own laboratories, many of which are internationally accredited, either within individual enterprises or an industry organization.

Many technical assistance projects in this field have directed their attention at *either* public sector agencies *or* private entities. This stems from the specific mandates of particular donor agencies, the particular requirements of certain overseas trading partners, or the need to be very pragmatic in order to get quick results in the face of an impending trade disruption. Yet, more effective and sustainable interventions have involved assistance for both public and private sector functions and, importantly, careful attention to linkages between public and private efforts. It would appear that the collaboration and tensions between the public and private sector strengthen the processes of prioritizing and sustaining resource allocations, hold different parties accountable for their actions, and more generally yield the results required by overseas trading partners — on an on-going basis.

Donor experience suggests that capacity-building efforts should generally aim to strengthen the capacities of both the public and private sectors. SPS management involves an array of functions with public good properties, especially in the fields of animal and plant health—yet there are other functions amenable to private sector solutions, whether on an individual or collective basis. The degree of substitutability between public and private sector performance of SPS functions depends not only upon their techno-economic characteristics, but also other factors including country and industry size, the broad level of development, the level and distribution of administrative/managerial capacities in the public and private sectors, the vertical and competitive structure of particular industries, and the volume of trade.

In relation to capacity building in the public sector, two major challenges are commonly faced. One is the overlap in responsibilities and limited coherence between various regulatory agencies and departments. This may involve the spread of limited human and financial resources across numerous agencies, multiple and conflicting interactions with the private sector, and problems with trading partners. Many countries are exploring options to coordinate better or even to consolidate various functions through formal or less formal umbrella agencies or committees. A second major challenge in the public sector is the sustainability of functions, whether owing to high rates of staff turnover, periodic or sustained budget constraints, or inadequate arrangements for service cost recovery.⁷³

⁷³ Provision of infrastructure to the public sector should be carefully designed to ensure that the equipment is matched by technical capacities of the staff or that the staff can be trained to use the new facilities and equipment without undue dependence, over the long term, on consultants and other forms of technical assistance.

Recent project experience with capacity-building in the private sector shows the importance of economies of scale or scope. Producer or industry associations can be very effective in catalyzing change within an industry, developing and enforcing various ‘codes of practice’, coordinating/implementing firm/farm technical assistance programs, and interfacing with both local regulatory authorities and representatives of overseas commercial or regulatory bodies. Much can be learned from such experiences.

In selecting partners from the private sector, donors have generally aimed to channel support to the “best, brightest, and financially fit” firms or producers or to those firms that provide the critical share of exports in specific industries. Focusing on such partners seems to be a cost-effective approach, yet almost certainly exacerbates trends toward increased consolidation of trade in high value, yet SPS ‘high risk’, products. Furthermore, priority industries are often most threatened by the least capable players, who, from ignorance or negligence, can do great damage to export prospects or industry reputation. The effectiveness of training or other technical assistance is partly, and perhaps very substantially, related to the management capabilities of the participating individuals/firms and, to a certain extent, the access of these firms to adequate financial resources to make necessary adjustments in their production operations or technologies. It is difficult for projects to apply a bottom up approach during capacity-building. Hence implementing agencies may need to reach smallholders through the government or downstream players, and reach SMEs through industry associations.

Another finding from recent experience is that SPS-related problems should not be addressed in isolation from other factors that affect industry or producer competitiveness. SPS interventions cannot possibly help firms that are otherwise unable to compete in the market because of poor product quality or availability, high costs of production or transportation, etc. It follows that it may not be cost effective to provide SPS management support at the very early stages of an industry’s development. Thus, prospective donors should channel their resources toward assisting industries that have already demonstrated their capacity to compete in regional or international markets and to effectively address other common constraints (for example freight logistics).

6.3 Reflections

The overall level of trade-related SPS capacity-building assistance is extremely modest given the significance of the challenges (and opportunities) facing developing countries. For example, Jaffee and Henson (2004) estimate that in 2000-01 some \$1.75 billion of developing country exports were affected by import border rejections or retentions. With increased resources going to food safety and agricultural health inspectorates in industrial countries and some developing countries, and with increasingly stringent private standards, the risk of future trade interruptions due to SPS matters could certainly increase.

While the current pattern of assistance appears to be appropriately focused on the ‘high risk’/‘high gain’ sub-sectors, it is inefficient that the bulk of interventions are triggered by ‘crises’ or (imminent) trade disruptions and involve reactive and remedial responses. This

is a costly and unsustainable form of assistance, both for the donors and the recipient country as the latter may incur significant losses in trade and damaging effects on reputation prior to benefiting from technical assistance. The support provided may, therefore, be geared toward damage control and restoration of past trade rather than being part of a strategic approach to SPS management and investment. In the context of a crisis and/or trade disruption, the range of options and the acceptable time frame for institutional and technological change may be dramatically reduced, perhaps leading to higher cost, less sustainable, and/or more inequitable solutions.

Rather than a defensive, ‘fire-fighting’ approach, it is preferable to adopt *preventative and progressive capacity building*. Here, a more strategic approach would be taken, considering SPS capacity needs within the wider challenge of agri-food system modernization; anticipating near and longer term requirements from (and opportunities within) external markets; anticipating the likely changes in the domestic market; and prioritizing capacity-building needs in ‘high risk’ or other sub-sectors based on both technical and economic considerations. Yet without a ‘clear and present danger’ there may be resistance to regulatory/institutional reform and to incurring costs associated with technological and/or organizational change. Hence, awareness and consensus-building may be important starting points, with particular attention given to cross-country experiences in gains/losses associated with compliance/non-compliance with emerging standards. Effective SPS management should be considered an increasingly important component of industrial/commodity supply chain competitiveness and become a *mainstreamed* element of strategies to strengthen such competitiveness.⁷⁴

Finally, it is evident that the strategic perspective presented here is at odds with the focus of SPS-related capacity building efforts to date and, more specifically, the focus of technical assistance providers and/or donors. As has been made clear above, the predominant focus is on the development of technical capacity aimed at achieving compliance. There is little or no recognition of the need for developing countries to be able to make strategic decisions with respect to their response to emerging standards, which might include challenging their legitimacy and/or negotiating changes. Yet, a primary focus of capacity-building should be on enabling developing countries to look forward and predict the food safety and agricultural health standards with which they are likely to be required to comply in the future and to respond proactively. Overall, this suggests that SPS-related technical assistance should aim at maximizing the strategic choices of developing countries, and exporters therein, with respect to standards.

⁷⁴ One of the core challenges in this regard is effectively assessing and prioritizing capacity-building needs. An approach to this is outlined in Chapter 7.

CHAPTER 7

IMPLICATIONS OF AGRI-FOOD STANDARDS FOR THE WORLD BANK

Previous chapters have described the dynamics of agri-food systems—including the emerging trends in official and private standards—and examined the opportunities and challenges these provide for trade and rural economic growth in developing countries. Case study and other evidence have been employed to highlight successful and not-so successful responses to these trends.

Building on these analyses, this chapter provides recommendations on how donors and international funding agencies, such as the World Bank, can help developing countries best strengthen their systems for food safety and agricultural health management and in so doing enhance their international competitiveness. The chapter first provides the rationale for the increased involvement of development agencies in this field. It then briefly notes the World Bank's comparative strengths and weaknesses in undertaking an expanded role. The chapter then enunciates the broad principles that should guide the involvement of the Bank and its partners. It concludes with recommendations on the main entry points for the World Bank.

7.1 Rationale for Bank and Other Development Agency Involvement

Global food markets currently constitute a dynamic commercial and regulatory environment; in this environment, low- and middle-income countries face greater challenges both in gaining and maintaining market access and in sustaining competitiveness. New and more stringent agri-food standards contribute to this environment. Although developing countries and enterprises have limited influence over what standards are set, they do have room for maneuver in designing policies and strategies to ensure compliance with them. Also, these countries and individual suppliers may have the latitude to negotiate, with buyers and bilateral trade partners, how these requirements are enforced.

The main rationale for World Bank involvement relates to the host of market failures faced by producers, processors, and consumers in the realm of food safety and agricultural health. To overcome these market failures, periodic or sustained public interventions may be needed. As noted earlier, many aspects of capacity building in this field involve the generation of public goods and therefore fall clearly within the World Bank's mandate. For example:

- Trade in certain animals, plants and food products can contribute to the transmission or movement of diseases, pests, contaminants, and microorganisms between countries, with the potential for causing illness, loss of life, and consequently, large economic losses. Hence, at the international level, improving systems to detect, control, and eradicate such hazards will benefit not only domestic producers and consumers but also those of neighboring countries and

trading partners, developed and developing countries alike. Thus, there are potentially large externalities associated with the management, and mismanagement, of sanitary and phytosanitary hazards.⁷⁵

- At the national level or within particular supply chains, there is wide scope for market failure in relation to food safety and agricultural health. The failure of certain farmers to effectively manage animal and plant diseases may lead to the spread of such diseases into other locations. Conversely, there may be positive externalities associated with exporter efforts to comply with external market standards. Such efforts—say related to the control of animal diseases—may result in wider productivity gains for local producers and in health benefits for domestic consumers. These spillovers can thus contribute to poverty reduction (over and above the direct benefits accruing to farmers, workers, and others who participate in export-oriented supply chains). There is a strong moral hazard aspect in food safety control, in areas such as maximum residue limits of pesticides, or pathogen levels in food of animal origin, as these cannot be easily detected by the general public.

Interventions in SPS management systems can therefore contribute to growth, poverty reduction, and the pursuit of national and international public goods. Further, despite the progress made by many developing countries in beginning to address the challenges posed by rising standards, the playing field will almost certainly become more challenging in the years ahead, given trends in consumer attitudes and preferences, the changing composition of international food and agricultural trade, and continued advances in science and technology.

In formulating and implementing food safety and agricultural health standards, many developing countries are seeking external assistance, as called for under the SPS Agreement. Until quite recently, the provision of technical assistance and other capacity-building measures in this area through World Bank-supported projects was quite modest. However, client demand for support appears to be increasing substantially. Table 7.1 provides information on ten projects involving trade-related SPS management components that are either being implemented or in advanced stages of preparation. In more than a dozen other countries plans are under way either to assist in SPS strategy formulation or to design project subcomponents in this field.

⁷⁵ Indeed, the benefits of controlling a pest in a developing country may be greater, in financial terms, for the highly productive agriculture in a neighboring or trade partner developed world, than for the lower productivity agricultural sector in that developing country.

**TABLE 7.1 WORLD BANK PROJECTS WITH COMPONENTS ON TRADE-RELATED
AGRICULTURAL SAFETY**

Project	Start of project	Expected closing of project	Size of project loan (\$ millions)	Agricultural safety components funded by World Bank (\$ millions)	Industry focus for agri-safety support
China Sustainable Coastal Resource Development	1998	2006	100.00	19.50	Fisheries
Uruguay Foot and Mouth Disease Emergency Recovery	2001	2005	18.50	6.30	Livestock
Niger Agro-Pastoral Export Promotion	2001	2005	10.35	0.60	Livestock
Tunisia Agricultural Support Services	2001	2007	21.30	4.62	Horticulture
Jordan Horticultural Exports Promotion and Technology Transfer	2003	2006	5.00	3.40	Horticulture
Bosnia Small-Scale Commercial Agriculture Development	2003	2009	12.00	0.30	Horticulture
Peru Trade Facilitation and Productivity Improvement	2004	2006	20.00	1.30	Cross-cutting
Philippines Diversified Farm Income and Market Development	2004	2009	60.0	15.00	Cross-cutting
Romania Modernizing Agricultural Knowledge And Information Systems Project	2005	2010	50.0	13.20	Cross-cutting
Kazakhstan Agricultural Competitiveness Project	2005	2010	25.8	10.80	Cross-cutting

Among lower- and middle-income countries (although to a lesser extent in the latter), there are an array of common food-safety and/or agricultural health-management weaknesses. These include the following:

- Lack of widespread appreciation in the public and private sectors of the importance of agri-food standards to trade and the strategic options available to them.
- Insufficient awareness of international food standards and limited application of basic risk management practices, including HACCP and ‘good’ agricultural or manufacturing practices at various points in the supply chain.
- Lack of technical capacity and resources to develop standards and to update SPS legislation.
- Relatively poor enforcement capacity as regulatory agencies are under-funded, under-staffed, and lack appropriate infrastructure.
- Insufficient public-private dialogue on standards development, implementation, enforcement, and export market strategy, and
- Limited capacity to control plant and animal pests and diseases, as well as monitor and report their incidence.

These and other shortcomings can be addressed through technical assistance and related capacity investments. There are several reasons to expect increased demand for such assistance. First, more countries are seeking to diversify their agri-food exports,

especially in high-value food products such as fish, meat, and horticultural products that are much more vulnerable to SPS-related problems than traditional food and agricultural exports. Second, the industrialized world is strengthening its systems for agri-food inspection, a move also being made, to a lesser extent, by middle-income countries; this development raises the risk of future trade interruptions. Third, the range and depth of private agri-food standards will have increasing effects on the market access and competitiveness of developing countries. Fourth, South-South trade in SPS-sensitive products is growing at a rapid rate, yet food safety and agricultural health challenges are being encountered in this trade. *Considering these trends, together with the multiple potential linkages between standards, growth, and poverty reduction, and the prominence of public goods in food safety and agricultural health, there is a very strong argument for increasing both the analytical and operational role of the World Bank in this field.*

7.2 The Comparative Advantage of the World Bank

Trade-related SPS management is a relatively complex and fast-moving field, requiring a range of expertise and varied instruments for providing assistance. The World Bank has a number of notable strengths and opportunities to contribute to the enhancement of developing country capacities in this area. It also has some limitations, although these can be overcome by exploiting synergies with various development partners. Table 7.2 summarizes the Bank's comparative advantages, weaknesses, and the opportunities they present to participate further in this field.

TABLE 7.2 COMPARATIVE ADVANTAGE OF THE WORLD BANK IN THE SPHERE

Strengths	Weaknesses	Opportunities
Strong convening power and experience in facilitating stakeholder dialogue	Very limited technical staffing with experience in food safety or agricultural health	Leverage resources and partners to facilitate multi-stakeholder effort
Strong analytical skills	Relatively slow mobilization of resources	Scope to outsource technical analysis and design
Broad experience in applying cost/benefit analysis	Relatively high cost in project formulation	Scope to build standards subcomponents into an array of ongoing/planned ESSD and PSD projects
Field presence in most client countries	Limited (non-IFC) experience in collaboration with the private sector in the agri-food sector	Scope to utilize WBI and GDLN for training and networking
Capacity to work at the macro level and across sectors (trade, agriculture, environment)	Limited capacity for piloting interventions	Scope to incorporate standards-related analysis in planned Integrated Framework and other trade studies
Capacity to combine policy advise with investments	Limited possibilities for funding external TA as many clients prefer grant financing for TA	Mobilize donor funding for grants, e.g., through STDF

Hence, at present, the Bank's relative strength is its understanding of the big picture and its ability to analyze pertinent issues; it can also underpin its analytical work with the

required investments. Its relative weaknesses lie in implementation, in part due to its limited technical capacity in this area and the difficulties it has in working with the private sector. Partnerships with technical agencies (e.g., the FAO), the OECD's bilateral agencies, and the private sector would address these weaknesses and are therefore an essential feature for the future program. The need for technical assistance grants may be obtained through special funds, such as the Standards and Trade Development Facility (STDF), provided by donor agencies.

7.3 Guiding Principles for Bank Involvement

The nature of the SPS management challenge, and the recent experiences of country and donor agencies in adopting strategies and building capacity in this field, lead to the following broad principles to guide the World Bank and its partners:

First, *SPS management challenges must be addressed within the context of agricultural supply-chain (or export) competitiveness*. Although it has some distinct technical dimensions, this is not a stand-alone field of action. Resolving specific SPS matters while other crucial dimensions of competitiveness—such as the investment climate, logistics, etc.—go unattended, will likely produce little trade growth. Nevertheless, resources are scarce and the potential benefits of investing in SPS management capacities and systems should be weighed against alternative uses of those resources to enhance competitiveness.⁷⁶

Second and related, *the World Bank should encourage its clients to adopt a proactive (preventive) approach to this field instead of falling back on 'fire-fighting' or defensive coping strategies*. As noted in Chapter 3, a proactive approach opens up more technical and administrative options and frequently enables governments to take on a variety of facilitative roles rather than engage primarily in control and enforcement measures. In adopting a proactive stance, countries are likely to give priority to high risk/high gain subsectors where SPS-related challenges/opportunities are most significant. For many countries, this is likely to relate to the supply chains of fishery, animal, horticultural, or spice/nut/condiment products. The World Bank should be especially responsive to the assistance needs of high-risk countries, particularly lower-income countries whose existing trade and future growth prospects consist largely of the high risk/high gain product lines.

Third and also related, *the World Bank and its partners should employ and encourage its clients and development partners to employ more economic analyses in helping to determine the constraints on and priorities for action in this field*. This is an operational field traditionally dominated by technical analysis of hazards and solutions, with little use of *ex ante* or *ex post* cost/benefit or cost-effectiveness analyses. But technically feasible solutions are not always desirable. Some partial or second-best solutions (such as sharing

⁷⁶ Yet WTO members do have certain obligations as stipulated under the SPS Agreement. Revisions may be needed in national legislation, standards, and inspection systems to meet these obligations and enable other WTO members to supply them with food and agricultural products.

capacities on a regional basis) may be more cost-effective than so-called best technical solutions. Various approaches or technologies can typically be employed to address particular SPS challenges. Economics should provide a strong voice when governments consider the options and prioritize investments more generally. Hence, there is a need to combine risk analysis of the technical hazards with economic cost-benefit analysis.

Fourth, *the Bank should encourage its clients to consider a hierarchy of functions when determining priorities and the sequence of investments*. As elaborated below, the foundation stone for a well-functioning SPS management system is broad awareness among stakeholders about (1) the relevance and importance of food safety and agricultural health to competitiveness and (2) the available strategic options to address such concerns. In turn, rather basic GAP, GMP, supply-chain coordination and other management practices need to be applied at farm and enterprise levels. More sophisticated and costly technical functions and trade diplomatic skills are important but only to the extent that they add value to a solid foundation. Related to this is the need to cover the *whole supply chain from the producer to the consumer* and identify both weaknesses and strengths of every player in the chain, including the government and the regulatory framework and the private sector. SPS-related risks are often not limited to one stage of production or processing. Interventions geared only to improving final product testing are of little value if the basic building blocks for quality and food safety control have not been effectively introduced earlier in the supply chain.

Fifth, *SPS management capacity should be strengthened in both the public and private sectors, with emphasis on their effective interaction*. Traditionally, SPS management was perceived as largely a public sector responsibility and assistance programs focused accordingly. More recently, some donors have been frustrated in their efforts with public agencies and have sought to help private entities address particular problems. This either/or approach is generally not effective or sustainable. There are critical SPS management functions for both the public and private sectors and various areas where cooperation and joint provision are essential to ensure competitiveness.

Sixth, *assistance in this field should explicitly recognize potential structural and distributional impacts and make specific provisions to address the particular challenges/opportunities of small stakeholders and other vulnerable groups*. Solving SPS constraints and helping to maintain international market access should not be the sole purposes of development assistance. The direct or indirect impacts on poor stakeholders need to be considered in the design of these measures and special efforts made to ensure that these groups may benefit (or are at least not unduly harmed) by them.

Seventh, *greater attention needs to be given to the sustainability of selected approaches and investments*. Sustainability has not been a primary concern in most instances of SPS ‘fire-fighting’. The result is a landscape of “white elephant” laboratories and inspection systems that lack sufficient recurrent budgetary resources to effectively perform. Sustainability relates to both the human capital and financial resources to maintain facilities and information/management systems. Emphasis should be put on creating stocks of knowledge, pools of experts and trainers, capacity sharing arrangements, and

cost recovery systems in the development of programs. Given the weak public sector capacities and incentives affecting many of the poorest countries, attention might well focus on how the private sector could carry out important SPS management functions, with oversight from government.

The World Bank and its partners could use the above seven principles and employ screening devices when examining proposals submitted by potential clients and other development agencies for investments in SPS capacity-building. Following these broad principles in no way implies that ‘one size fits all’ in this field. While the above principles could well constitute good practice in the orientation the World Bank and other donor/technical agencies bring to this topic, the specific mix and mode of interventions will frequently vary among countries and industries.

7.4 Entry Points for the World Bank

The Bank can appropriately pursue three main sets of roles in this field—namely, (i) advocacy, analysis and training; (ii) priority-setting and development of country strategies/action plans; and (iii) investment lending and regulatory reform.

7.4.1 Advocacy, Analysis and Training

Stronger advocacy roles at several levels are needed, in which the World Bank can take a lead.

- At the global level, the Bank can advocate and participate in stronger partnerships that offer technical assistance and capacity-building among multilateral agencies, between industrial and developing countries, and between the public and private sectors;
- Among industrial countries, there is a continuing need for the greater harmony of standards and requirements to ensure that their SPS measures do not unduly restrict trade, especially for suppliers from developing countries. Industrial countries should be encouraged to include developing country impact assessments within their own *ex ante* analyses of proposed SPS regulatory measures.
- At the regional level, the World Bank and its partners can encourage greater standards harmonization and capacity-building, while urging developing countries to use standards to facilitate rather than block regional trade; and
- At the country level, continued advocacy of the guiding principles described above is needed, as well as dissemination of good practices in policy and technical aspects of SPS management.

This advocacy program should be underpinned by a limited program of empirical research, with continuous dissemination of the findings to policy-makers, development practitioners, and others. Key issues identified in this study that require additional analysis, include:

- The effects of SPS measures on South-South trade, whether within or outside of regional groupings;
- The distributional impacts of standards—between countries and within and between different supply chains, firms, and farming entities;
- The further quantification of tangible and intangible benefits from (and overall returns on investment from) enhanced SPS management capacities;
- The scope, limitations, and suitable conditions under which coordinated and certified small farmer production can be a reliable and cost effective alternative to vertical integration and use of larger commercial farm suppliers within supply chains applying rigorous food safety and other standards, and
- The actual incidence and modalities of standards enforcement by developed countries and their impacts on market access by developing countries.

7.4.2 Priority-Setting and Development of Country Strategies/Action Plans

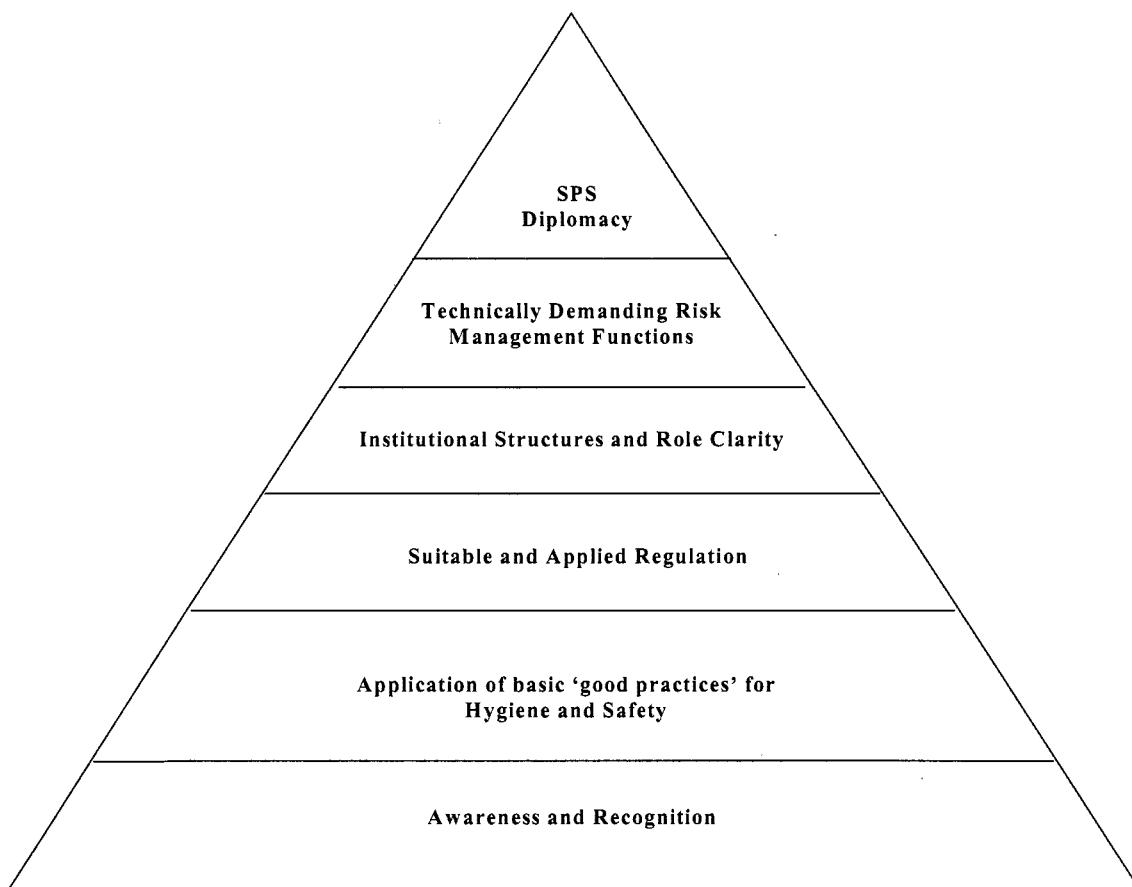
Priority-setting in SPS management can be a complex task, as many developing countries have multiple deficiencies in their legal/regulatory systems, weak capacities in an array of SPS management areas, and unclear or overlapping responsibilities among public agencies and between these and the private sector. SPS management involves an agglomeration of basic and more sophisticated technical and administrative functions (Box 7.1), seemingly requiring a broad range of skills, physical infrastructure, institutional structures and procedures, and financial resources.

BOX 7.1 SOME BASIC FOOD SAFETY AND AGRICULTURAL HEALTH MANAGEMENT FUNCTIONS

- Apply GAP, GMP, HACCP, and QM at farm and enterprise levels
- Develop appropriate legislation and standards
- Register/control feed, agro-chemicals, veterinary drugs, etc.
- Conduct basic research, diagnosis, and analysis
- Accredit laboratories/veterinarians/other third party entities for official duties
- Develop/apply quarantine procedures, including for emergency situations
- Carry out epidemiological surveillance and information management
- Inspect/license food establishments
- Develop/maintain pest or disease-free areas
- Test products for residues, contaminants and microbiological content
- Verify/certify biological materials (seeds; embryos, semen)
- Verify/certify imported/exported products related to established risks
- Establish/maintain identity of products (for example traceability)
- Report possible hazards to treaty/trading partners
- Notify WTO/trading partners on new SPS measures
- Participate in international standard-setting processes

One way to simplify this task is to cluster these functions into a pyramid-shaped hierarchy of functions (Figure 7.1). Functions/actions toward the base of the pyramid represent the foundation stones, while those toward the top add value and sophistication to the entire system of SPS management and gain in importance as the industry matures and encounters increasingly complex technical, administrative, and even political challenges.

FIGURE 7.1 HIERARCHY OF TRADE-RELATED SPS MANAGEMENT FUNCTIONS



The bedrock of the system is broad awareness among participating stakeholders about the relevance and importance of food safety and agricultural health to the competitiveness of their country/industry/supply chain/firm and recognition of their own role in this system. Where this awareness is especially weak, any regulatory enforcement system will almost certainly be overwhelmed. Awareness of major SPS challenges and opportunities is needed at several levels. It is needed among senior agricultural and trade officials in order to assign appropriate priorities for public programs and expenditures. Awareness is needed among the owners and managers of agricultural processing and trading companies, and the industry organizations that represent them. These people make investment, personnel, and other decisions—and engage in self-policing activities—

which strongly determine the willingness and capacity of firms to meet emerging standards. Awareness is also critical—and perhaps most difficult to build—among the large numbers of farmers and farm and industry workers who produce and handle food and agricultural raw materials on a day-to-day basis.

Another core set of building blocks that proceed from broad awareness is the application of basic risk-management good practices at the farm and enterprise levels—namely, GAP, GMP, HACCP, and various quality-management systems. This mostly involves training staff and family members in basic hygiene, in the proper use and storage of potentially hazardous substances, and in basic record-keeping about production practices and cycles, etc.

With broad awareness and common application of good practices, many potential SPS risks can be effectively managed. Yet other risks cannot be fully managed on such a decentralized basis. They are more systemic in nature and require broader oversight or collective action, requiring basic research, surveillance systems, and quarantine and emergency management systems. Even if individual farms and enterprises apply good practices, they may not be able to control all hazards—thus the need for scientific testing and verification systems. Many of these higher-order functions require particular technical skills, certain equipment, well-defined procedures, and recurrent funding. Some need to be mandated by law in order to ensure that they are done and done properly. A proper regulatory framework and transparent institutional structures is therefore placed in the middle of the pyramid.

At the top of the pyramid is something called SPS Diplomacy, which includes the international obligations of individual WTO members but also relates to a strong engagement in the technical and political realm of international standard setting (both official and private), negotiations with bilateral trade partners and with regional integration partners on matters dealing with harmonization, equivalence, joint programs, special considerations, etc. This is a difficult and serious art, which relatively few developing countries have thus far mastered.

This specific hierarchy of functions controverts not only the experience of the World Bank and other donors but also the dominant responses of countries with regard to capacity building. This is illustrated by the priorities frequently identified in questionnaires submitted by countries to the World Trade Organization's SPS Committee. Much of the focus of developing country-donor interaction has been at the top parts of the pyramid, covering laboratory facilities and equipment, technical assistance and equipment for surveillance systems, and training in negotiating skills. Although these capacities undoubtedly need strengthening in many countries, the effective use of such capacities depends enormously on the strength of the foundational and mid-level functions, the clarity of institutional roles, and the effectiveness and suitability of legislation. Where the foundation is weak, the return on investment in laboratories and participation in international standards-setting meetings of CODEX, IPPC, and OIE is substantially reduced.

Cost implications differ according to the level in the hierarchy:

- Elements at the *bottom half* of the pyramid require decentralized efforts that can reach potentially large numbers of farmers, employees, businesses, etc. The costs associated with implementing these functions are generally not especially high (although sometimes they might require certain infrastructure), yet the challenge here is reaching potentially dispersed stakeholders in a cost-effective way.
- Elements in the *top half* of the pyramid typically involve interactions with participants/stakeholders in national ministries (agriculture, commerce, and health) and in the federal/state capital cities. These items tend to be more expensive, and some entail rather “lumpy” investments in hardware, for which cost-benefit considerations are generally needed.

Where client demand is solely or largely for assistance at the upper ends of the pyramid, potential funding agencies should either be satisfied that the existing foundation stones are strong or are being successfully strengthened through parallel programs. In most cases, the optimal design of a project will involve interventions at multiple points in the pyramid.

While complex, proper priority-setting is absolutely essential, and a necessary element in the proactive (preventative) approach, which this report advocates. The output of any priority-setting process can vary:

- In countries with a strong trade focus and relatively strong institutions dealing with SPS management, the product could be a *National SPS Management Strategy and Action Plan*, providing a comprehensive picture of the strengths and weaknesses of national food safety and agricultural health systems and laying out a subset of priority measures—policy and regulatory reforms, investments, and so on—to be undertaken, over the short (one year) to medium (three years) terms.
- In the less well developed economies, where institutional capacity is weaker or more fragmented, a more modest output in the form of an *Industry or Supply Chain Standards Strategy* or a *Standards Compliance Action Plan* would normally suffice. This Action Plan could center on one or several high risk/high gain export-oriented sub-sectors.
- Hybrid outputs could also be envisaged. These would combine one or more industry action plans with an analysis of priority actions in specific cross-cutting technical or administrative fields (i.e. WTO accession requirements, accreditation and certification systems, plant health risk management).

The role of the Bank and partner agencies in the priority-setting process should be that of facilitator, as the country/industry stakeholders should own the strategies or action plans. External facilitators can help in evaluating current capacity strengths, weaknesses, opportunities, and threats and help stimulate critical dialogue regarding the roles and

interactions between the public and private sectors. By applying the above-noted guiding principles, the World Bank and partner agencies can help improve the quality of priority-setting processes.

7.4.3 Lending and Regulatory Reform

Financial support can be provided for various kinds of capacity-building activities, often included in broader lending activities for boosting competitiveness, promoting agricultural diversification, and so forth. Examples on the public side are the provision of infrastructure, the development of an effective accreditation system, and the strengthening of specialized services and testing facilities. The rationale for such investments would be provided in a priority action plan. On the private side, support can be provided for enterprise and supply chain infrastructure, the strengthening of associations, and training and awareness-raising with regard to GAP, GMP, HACCP, and quality management. There might also be joint public-private investments in cold chain infrastructure, the development of tracking/tracing systems, the strengthening of certification capacities, etc.

Other types of support may be justified to serve a demonstration function. For example, support for the involvement of smallholder farmers in coordinated supply chains may help to identify institutional and technical means to reduce the transaction costs incurred by the private sector (for example, related to product traceability) and thus induce additional companies to maintain smallholders as a core part of their product or raw material procurement systems.

Emergency situations do emerge in this field, including outbreaks of plant pests and animal diseases, or instances of microbiological contamination in traded food products. These can result in large losses, in financial terms as well as in human, animal, or plant health. The World Bank's project development and decision-making system generally limit the provision of immediate assistance in the face of emergencies, although there have been examples when existing project funds have been reallocated to address animal disease outbreaks promptly (for example, with the occurrence of African Swine Fever in Ghana) or provide timely assistance to help countries respond to drought or animal diseases (e.g., in Morocco and several southern African countries; Vietnam's avian flu emergency). These emergency responses are most effective when good surveillance systems and contingency plans are in place—ahead of time.

Recognizing that emergencies do periodically occur in this field and noting the Bank's own strengths and limitations, the most suitable roles for the Bank in this regard would be to work with other partners in planning and implementing *emergency contingency systems* in client countries (including pest and disease surveillance and product traceability systems, establishment of emergency pest/disease quarantine systems, emergency insurance systems, etc.), and *post-emergency rehabilitation programs* that might involve compensation schemes to farmers, the rebuilding/replanting of herds/crop coverage, and other investments needed to rebuild quality/safety management systems.

As seen above, market failures in SPS management justify public interventions. But even where public goods are involved, these do not necessarily imply that governments need to undertake the function or service. Public capacities for implementation may be very weak and this may be tied up with broader constraints within the civil service, which are not amenable to quick resolution. It may be more attractive to contract private providers of the service, or, using partial grants, to encourage the private supply of this service. Examples include private certification with public oversight and tests carried out by private laboratories with public accreditation.

Public interventions could therefore take a variety of forms in this field:

- Legislation and regulation, and its enforcement, a core public responsibility;
- Education and information sharing;
- Investment in physical infrastructure, either uniquely or in conjunction with the private sector;
- Direct provision of functions, with or without private co-funding or technical input;
- Mandating or encouraging private functional performance, with or without public co-funding or technical support; and
- Stimulating private investment through subsidy, matching grants, tax advantages, etc.

These considerations can serve to guide the Bank's lending in SPS management. With regard to regulatory reform, adjustments in the SPS arena can be pursued as part of wider reforms in trade facilitation (customs and logistics, for example) or the broader investment climate. The technical support should be done in partnership with other donors and technical agencies, especially the FAO and the three international standard-setting agencies, CODEX, OIE, and IPPC.

The Standards and Trade Development Facility should provide a vehicle for collaboration in supporting regulatory reforms as well as for broader capacity building for developing countries. This donor-supported initiative brings together the Bank, the World Trade Organization, the World Health Organization, the FAO and the standard-setting agencies, to enhance information-sharing on standards and related technical assistance activities, to further support country assessments of SPS capacity constraints and needs, and to finance selected capacity building programs at national or regional levels.

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ANNEX RESEARCH PROGRAM CASE STUDIES

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