

Technical Regulations and Standards

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SYNOPSIS

The current landscape of technical regulations and standards related to agriculture and agrifood is complex and rapidly evolving. Standards represent major challenges for the targeted sectors and industries, yet they also present opportunities to catalyze innovations while achieving public health, trade, environmental, and social objectives. Standards can help to reduce information asymmetries and externalities and promote fair competition. Some agricultural export industries in developing countries have used compliance with standards to gain an important competitive advantage; compliance required not only innovation in production and processing but in collective and organizational behavior. In an evolving landscape of standards, however, individual, one-time innovations offer limited opportunities to leverage long-term benefits. What is required instead is a process of strategic planning, supported by continuous innovation and improvement, to take on new challenges and opportunities as they emerge. Approaches to harmonizing standards across countries or industries can reduce transaction costs by reducing duplicative functions of conformity assessment, including testing and certification. National policy makers need to strike a balance between domestic and international trade interests and, as much as possible, maintain close involvement in regional and international standard-setting efforts.

BACKGROUND AND CONTEXT

A “standard” is a document approved by a recognized body that provides, for common and repeated use, rules, guidelines, or characteristics for products or related processes and production methods. Compliance with standards is not mandatory. “Technical regulations,” on the other hand, specify product characteristics or their related processes and production methods, including the applicable

administrative provisions, with which compliance is mandatory. Technical regulations include import bans (total or partial), technical specifications (process and product standards), packaging standards, information requirements, and requirements for labeling and claims.

Standards and technical regulations for agriculture and food have become increasingly important in recent decades, but they date to ancient times. Assyrian tablets, for example, describe the method to be used in determining correct weights and measures for food (FAO and WHO 2005). From the late 1800s to early 1900s, countries started to enact national agrifood standards. The ensuing proliferation of requirements complicated the landscape for international trade to such an extent that the first international standards began to be adopted in the early 1900s. Over the course of the century, but especially in the latter half, broader efforts to enact agriculture and food standards at the international level prompted important innovations in the international institutional framework for setting standards (see box 6.30).

The number of agriculture and food-related issues subject to standardization has grown tremendously in the past several decades.¹ This momentum reflects the intensification of regional and global trade and heightened concerns over accompanying threats to food safety and animal and plant health. It also reflects a wider set of innovations in science and technology that permit very sensitive detection and analytical methods, as well as improved knowledge of the quality and associated health hazards of agrifood products. Many standards and regulations relate to naturally occurring hazards, such as foodborne pathogens and toxins, while others have been introduced by innovations in agricultural technologies to increase productivity (such as the use of pesticides, veterinary drugs, and other chemical compounds).

Changes in consumers’ concerns and perceptions, as well as pressure from civil society and the enactment of international agreements,² have been critical in expanding the range of desirable attributes associated with the quality of

Sanitary and phytosanitary (SPS) measures are taken to protect: (1) human or animal health from risk arising from additives, contaminants, toxins, or disease organisms in food, drink, and feedstuffs; (2) human life from risks associated with diseases carried by plants or animals; (3) animal or plant life from pests, diseases, and disease-causing organisms; and (4) a country from other damage caused by the entry, establishment, or spread of pests.

The need to fight animal diseases (zoonoses) at the global level led to the creation of the *Office International des Epizooties* (OIE) through an international agreement in 1924. An international agreement on plant health was reached in 1952 through the *International Plant Protection Convention* (IPPC). The *Codex Alimentarius Commission* (CAC), focusing on food standards in relation to safety risks, was created in the early 1960s. These international organizations have become even more relevant since the mid-1990s, when they were recognized as the international reference for settling disputes and for international trade under the World Trade Organization (WTO) Agreement for Sanitary and Phytosanitary Measures.^a

Under the agreement, countries are encouraged to present their concerns to the WTO regarding measures adopted by trade partner countries that do not follow the stated principles. According to WTO, of 312 SPS-related trade concerns raised by countries to the SPS committee over 1995–2010, 28 percent related to food safety, 25 percent to plant health, and 41 percent related to animal health and zoonoses. Animal health concerns mainly included foot-and-mouth disease (24 percent of concerns), transmissible spongiform encephalopathy (35 percent of concerns), and avian influenza.

Source: Authors; WTO 2011.

(a) For zoonoses, the International Health Regulations enacted in 2005 are an international legal instrument with the purpose and scope to prevent, protect against, control, and provide a public health response to the international spread of disease in ways that are commensurate with and restricted to public health risks, and which avoid unnecessary interference with international traffic and trade. Another international agreement related to biological risks is the Convention on Biodiversity Cartagena Protocol, discussed in TN 4.

The Agreement on Technical Barriers to Trade (TBT) deals with product standards. It aims to prevent national or regional technical requirements or standards in general from being used as unjustified barriers to trade. The agreement covers standards relating to all types of products, including industrial and agricultural products. Food standards related to SPS measures are not covered. Codex decisions recognized by the TBT Agreement include those on food labeling, decisions on quality, nutritional requirements, and analytical and sample methods.

The *International Organization of Standardization* (ISO) also enacts international standards; those applicable to agricultural industries and enterprises include standards for quality, safety, and environmental management (series ISO 9000, ISO 22000, and ISO 14000, respectively). The agricultural sector also benefits from standards dealing with conformity assessment that apply across sectors (ISO 17000 series). Other international organizations setting global standards relevant to agriculture include the *International Seed Testing Association* (ISTA) and the *International Federation of Organic Agriculture Movements* (IFOAM).

A plethora of private initiatives also seek to have a global reach. GLOBALG.A.P. enacts standards on good agriculture practice, and the Global Food Safety Initiative (GFSI) focuses on Hazard Analysis and Critical Control Point (HACCP)-based standards with application in agrifood industries. Still other private initiatives apply to particular agricultural subsectors, for example export crops such as coffee, cocoa and tea.

agrifood products. Demands go beyond a product's characteristics (product standards) to include specifications on the conditions under which products are produced and packaged (process standards, which now often include sustainability considerations). Table 6.2 lists examples of the broad range of standards and technical regulations applied to food and agricultural products. The demand for such standards

has induced innovation at many levels in the agricultural sector (box 6.31).

ACTIONS AND INVESTMENTS NEEDED

The capacity of standards and technical regulations to achieve their intended outcomes and also catalyze agricultural

Table 6.2 Examples of Standards and Technical Regulations Applied to Agriculture and Agrifood Products

Food safety	Animal/plant health	Quality or technical attributes	Environment	Social
<ul style="list-style-type: none"> • Pesticide residue limits • Microbiological standards • Traceability requirements • Hygiene requirements • Vet. Drug residues • Chemical & other contaminants (e.g., mycotoxins) • Code of good agricultural practices 	<ul style="list-style-type: none"> • Plant material quarantine • Pest risk analysis needs • Fumigation requirements & restrictions • Bans/restrictions on antibiotic use in aquaculture • Disease-free areas • Disease surveillance • Restrictions on veterinary drugs • Traceability of animals • Plant material quarantine • Phytosanitary certificates • GMO varietal approval 	<ul style="list-style-type: none"> • Quality grades • General labeling requirements • Packing standards • GMO labeling • Restrictions on animal feed ingredients • Nutritional labeling 	<ul style="list-style-type: none"> • Pesticide use restrictions • Regulations on water/soil contamination codes for organic • practices & certification • Protection of specific species • Fish catch restrictions • Regulations on animal waste effluent • Water efficient regulations • Chemical use restrictions • Biosafety regulations (for GMOs) • Codes to limit biodiversity loss 	<ul style="list-style-type: none"> • Monitoring of child labor • Occupational health standards • Animal welfare monitoring • Right to association • Minimum wage

Source: Adapted from Jaffee et al. 2005.

Box 6.3I Standards Induce Innovation throughout the Agriculture Sector

Innovation along agricultural supply chains. The serious effects of mycotoxins on human and animal health following consumption of specific contaminated products (such as groundnuts and maize) have led many countries to enact technical regulations establishing maximum permitted levels of mycotoxins. In sub-Saharan Africa, where the problem is especially serious, numerous collaborative research initiatives have been undertaken to identify cost-effective management options to reduce the threat to trade and human health. Research has emphasized on-farm technologies such as biological control, resistant/tolerant varieties, agronomic practices, cost-effective diagnostic tools, and practices and technologies for drying, storing, and processing food and feed.

Innovation in alternative control methods. Bans on hazardous pesticides and other chemicals for treating pests and diseases are a major incentive for innovations. Methyl bromide, used especially in quarantine operations for controlling pests affecting plants and plant-derived materials, has been recognized as an

ozone-depleting substance under the Montreal Protocol. Since 2010 the European Union has banned its use for most purposes, including quarantine and pre-shipment fumigations, boosting the search for alternative control mechanisms.

Innovation in supply chains. Record-keeping and traceability requirements have been incorporated into public and private standards, leading to innovations in supply chains that include simple tracking methods (pen and paper) as well as more sophisticated systems based on barcodes, radio-frequency identification, wireless sensor networks, and mobile devices and applications.

Innovation in standards themselves. The past two decades have seen the emergence of tremendous innovations in the way standards are developed and implemented. For example, the move toward system approaches to food safety regulation has been influenced by two major developments: (1) the introduction of scientific risk analysis as the basis of establishing food standards and regulatory measures and (2) the

(Box continues on the following page)

adoption of food safety management systems, such as the Hazard Analysis and Critical Control Point (HACCP) system, and the subsequent move from testing end-products to preventive approaches. At the primary production level, HACCP-based approaches are being implemented, complementing a set of preventive measures packaged under good agriculture practices (GAP) programs.

Innovation in certification. The preponderance of system approaches and process standards has fostered the emergence of systems for assessing conformity based on third-party certification. This development opens opportunities for coregulatory approaches by the private and public sector (a combination of legislation and self-regulation by private operators). The movement toward self-regulation in the private sector has been pushed by the incorporation of concepts such as “due diligence” in regulations; due diligence

emphasizes the private sector’s specific obligations in supplying agrifood products to consumers.

Innovation by private actors. Private “codes of practice” and standards related to sustainability (food safety, environmental and social criteria) are also proliferating, especially in horticultural and export crops (coffee, tea, cocoa, bananas), forestry, aquaculture, and livestock. Tremendous innovations have been put in place by the private sector and NGOs, not only for the development of voluntary standards—with a set of prescribed criteria for ensuring compliance—but also in terms of compliance-related infrastructure (such as the innovative auditing and certification systems described earlier). Innovation has extended to methods for ensuring that certification schemes include farmers of differing capacities. In this regard, the emergence of group certification has been a tremendous innovation, allowing engagement with organized groups of small-scale producers.

Source: Authors.

Note: In the United States, for example, the 2011 Food Safety Modernization Act (FSMA) expands the powers of the Food and Drug Administration; among other provisions, it empowers the FDA to create a system for recognizing bodies that accredit third-party auditors to certify eligible foreign facilities.

innovation is influenced by policy and regulatory frameworks and by the mechanisms enabling stakeholders to interact and collaborate to prioritize needs and investments, share costs, and perform specific functions related to SPS and quality. Action and investments are especially important for (1) aligning policy and regulatory frameworks to enable standards to contribute to specific policy goals (such as institutional reform) and (2) enhancing capacities to perform the wide range of roles and functions related to standards.

The alignment of policy and regulatory frameworks

Policy frameworks vary in accordance with specific national or subnational needs and circumstances. To understand how technical regulations and standards can contribute to policy goals, it is essential to clearly define the overarching goals of SPS and quality regulations. The legislative and regulatory process is one of an array of tools that government can use to achieve policy goals, but often it is only in the course of analyzing and discussing concrete legislative actions that outstanding policy questions are identified and resolved. In recent years, government awareness of the importance of

SPS and quality issues at the policy level appears to be increasing; for example, many governments have enacted specific food safety or organic production policies.

The alignment and harmonization of policy and legislative frameworks is often the first stage in creating an efficient system for SPS and quality standards. Harmonization addresses the complex, inefficient regulatory frameworks emerging from overlapping institutional roles, identifies outdated regulations and standards, and promotes inter-agency coordination and communication, among other institutional reforms.

For example, several countries have merged multiple laws related to SPS in new food laws and have updated regulations to reflect new institutional arrangements and competencies. Another trend is to promote integrated policy and regulatory frameworks for managing certain risks together. FAO has developed an integrated “biosecurity approach” for managing biological risks to animal, plant, and human health and life (including associated environmental risk), because they all involve systems and procedures for risk assessment and management, food contamination notification, and exchanging information.³

Strengthening institutional arrangements

Once the specific rights and obligations of stakeholders involved in the SPS and quality-related system are defined through the legislative process, the challenge is to create mechanisms enabling the relevant parts of government to collaborate. Major barriers to adopting more effective systems for SPS and quality standards are erected by bureaucratic divisions of responsibility. These barriers can arise from budgetary constraints, unequal institutional capabilities, differing cultures, limited communication of information, the absence of a shared vision, and/or disincentives to working horizontally. Actions and investments to overcome such barriers and achieve greater efficiencies are illustrated in box 6.32.

Enhancing capacities to perform the assigned roles and functions

Along with putting effective policy and regulatory frameworks into place and defining the roles and mechanisms for actors to work together, a third critical area for action and investment is the development and enhancement of the wide range of skills, physical infrastructure, institutional structures, and procedures that ensure that the organizations and individuals can perform SPS and quality-related functions effectively, efficiently, and sustainably. Table 6.3 provides examples of those functions.

Most functions listed in table 6.3 require broader oversight and/or some level of collective action. The foundations of an effective system for SPS and quality standards lie in the broad awareness among stakeholders that standards are

Box 6.32 Institutional Arrangements for Improving Systems for SPS and Quality Standards

Develop mechanisms for interagency and stakeholder coordination. Examples include memorandums of understanding among public agencies to clarify roles and responsibilities in specific areas (such as inspections), the establishment of task forces/working groups to respond to disease outbreaks or emergencies, and identifying liaison staff in each agency to facilitate communication and exchange of information. In many developing countries, task forces have emerged under the leadership of public or private entities, bringing public and private actors together to discuss actions to deal with challenges emerging from SPS and quality-related standards.

Coordinate functions under a lead agency. An example of this approach is ACHIPIA—the Chilean Food

Safety Agency—which defines food safety policy and coordinates the work of institutions with food safety roles.

Merge SPS functions into a single independent agency. An example of this type of arrangement in developing countries is the Belize Agricultural Health Authority (BAHA), established in the early 2000s. BAHA integrates food safety, quarantine, and plant and animal health functions into a single entity.

Consider costs and capacity. Implementation of any of these approaches will involve considerations of cost and capacity. In establishing a new agency, consider the leadership, facilitation, time, and resources required. All options need to be assessed in the context of existing capacities in the public and private sectors, the investments required, and the expected benefits.

Source: Authors.

Note: ACHIPIA = Agencia Chilena para la Calidad e Inocuidad Alimentaria.

Table 6.3 Organizational Functions Related to Sanitary and Phytosanitary (SPS) and Quality Standards

Functions related to SPS and quality standards

Registering and controlling feed, agrochemicals, veterinary drugs	Developing/maintaining pest- or disease-free areas
Conducting basic research, diagnosis, and analysis	Testing products for residues and contaminants
Accrediting laboratories, veterinarians, and other third-party entities	Establishing/maintaining product traceability
Developing/applying quarantine procedures	Reporting possible hazards to trading partners
Conducting epidemiological surveillance	Providing metrology services
Inspecting/licensing food establishments	Notifying the World Trade Organization and trading partners of new SPS measures
Inspecting and approving consignments for export	Participating in international standard-setting

Source: Adapted from World Bank 2005.

integral to the competitiveness of their country, sector, or firm and that they have particular roles to play in the system (World Bank 2005). For example, educated consumers, entrepreneurs, and others can contribute significantly to setting standards at the national level and push for improvements and efficiencies in the public sector.

It is also through the specific actions of individual producers and processors that compliance with SPS and quality-related standards is achieved. The private sector often invests heavily in compliance with SPS and quality standards (such as the use of HACCP or testing and certification at the farm level). Creating awareness and enabling the private sector to innovate through standards is an important dimension of capacity development. Along with the enactment of standards and regulations, the provision of incentives for private investment can be complementary and serve as a much-needed tool to support innovation. These incentives can take the form of quality promotion policies,

national quality awards, national productivity awards, and matching grant programs (to cite some examples).

Given the significant capacities needed to perform SPS and quality-related functions, the investments required to strengthen and develop those capacities can be considerable, particularly in developing countries (box 6.33). The first step in developing this capacity is to identify specific needs. Tools have been developed to support countries in assessing their capacity needs related to standards. For example, FAO has developed guidelines for assessing needs in food safety and biosecurity capacity (FAO 2007a, 2007b). OIE developed the Performance, Vision, and Strategy (PVS) tool as the basis for evaluating performance against international standards published in the Terrestrial Animal Health Code. The World Bank assists countries to perform needs assessments and develop action plans, some of which now include estimates of the costs associated with improving operational capacities (World Bank 2010).

Box 6.33 Actions and Investments for Uganda's Fish Export Industry to Comply with Standards and Technical Regulations

Hazards of a poorly performing regulatory system. Uganda's fish export industry burgeoned in the 1990s, largely because private investments in fish-processing facilities led to strong export performance in European markets. Public investments in food safety policy and regulatory frameworks and enforcement capabilities did not keep pace with private investments in the industry, however. At the end of the 1990s, the weak regulatory system exposed Uganda to three safety-related bans on its fish exports to Europe. Scientific proof that the fish were unsafe never materialized, yet the poor performance of Uganda's public regulatory and monitoring system was used to justify the ban.

Investing and innovating to reposition the industry. Public and private actors made a series of innovations and investments to lift the ban and regain the markets. Innovation and investment were favored by high demand in Europe, technical and financial assistance from development partners, the government's open and decisive leadership; and access to finance for private companies. Specific actions included: (1) streamlining regulations and strengthening the government authority that would implement them; (2) developing a new

fishery policy; (3) improving monitoring and inspection systems (drafting inspection manuals and standard operating procedures and training inspectors); (4) initiating regional efforts to harmonize handling procedures in the countries bordering Lake Victoria; (5) upgrading a (small) number of landing sites and plans for upgrading a substantial number of others; (6) upgrading processing plants' procedures and layouts; (7) opening up the U.S. market, which requires HACCP compliance; (8) installing two local laboratories and improving the quality of laboratory services provided to the industry; (9) increasing the number of processing plants and improving export performance; and (10) forming an Association of Quality Assurance Managers to address problems and concerns among industry players.

The fixed investment in upgrading factories, management systems, and other infrastructure between 1997 and 2001 was equivalent to about 6 to percent of the FOB value of exports over that period. The innovations were beyond those required to achieve compliance, such as the adoption of ISO 9000 and even ISO 14000 quality systems. In general, the process enhanced cooperation and relations between the regulatory agency and the industry.

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Box 6.33 Actions and Investments for Uganda's Fish Export Industry to Comply with Standards and Technical Regulations (continued)

Continuously innovating to meet new challenges and opportunities. Despite some lingering food safety issues, the larger challenge for the industry is to deal with the depleted waters and fisheries of Lake Victoria and more general environmental degradation, which have spurred negative campaigns against the industry in Europe. Regulatory controls, complemented by self-regulation and voluntary efforts to gain environmental and sustainable certification,

have been adopted to manage market risks. The volume of fish exports to the European Union has not returned to previous levels, partly because of the depletion of fish stocks and competition from other types of white fish from other countries. For the Ugandan fish industry, the capacity to learn from its experience, innovate in response to evolving market demands, and sustain its resource base will be critical to future viability.

Sources: Ponte 2005; Ponte, Kadigi, and Mitullah 2010; Jaffee et al. 2006.

The use of economic analysis to drive policy decisions related to SPS is often emphasized, but the complexity of current methods is driving efforts to find more flexible and practical methodologies. An innovative framework based on multi-criteria decision analysis is being validated by the Standards Trade and Development Facility.⁴

POTENTIAL BENEFITS

In the agriculture and agrifood sectors, standards fulfill a broad range of objectives. A general objective of standardization is to facilitate flows of information between consumers and producers (particularly information on unobservable characteristics, such as the use of GM ingredients) to facilitate trade and spur economic activity. For government, standards allow authorities to achieve several objectives, such as the protection of animal, plant, and human life and health; the protection of the environment; and the incorporation of social and sustainability considerations into agricultural production. Through standards, information imbalances and externalities can be addressed and fair competition promoted.

Compliance with standards is crucial for countries to participate in international trade, because it ensures the compatibility of components and traceability of products and raw materials from different places. Approaches to harmonizing standards between countries and/or industries can reduce transaction costs by reducing duplicative functions of conformity assessment, including testing and certification (Jaffee 2005).

From the perspective of the private sector, standards are a means of transferring technology and diffusing technical

information concerning products and processes. They provide incentives to local firms to improve the quality and reliability of their products. They can also be used as a risk management instrument, as a product differentiation tool, or as a cobranding strategy.

Several agricultural export industries in developing countries have used compliance with standards to gain an important competitive advantage. Examples include horticultural industries in Peru (Diaz and O'Brian 2003; Diaz Rios 2007) and Kenya (Jaffee 2003); the groundnut industry in Argentina and Nicaragua (Diaz Rios and Jaffee 2008); and the Brazil nut industry in Bolivia (Coslovsky 2006). In all cases, success required the incorporation of innovations in production and processing but, perhaps most important, in collective and organizational behavior. Examples of collective and organizational innovation include the formation of the Fondation Origine Sénégal—Fruits et Legumes; the collective self-regulation of Bolivia's Brazil nut industry; the collaborative arrangements and interactions between Peru's Commission for Export Promotion (PROMPEX, Comisión Para la Promoción de Exportaciones) and several subsectoral associations.

Clearly the impacts and distributional effects of non-compliance with SPS standards can be devastating for a company or an entire industry.⁵ The World Bank (2005) presents several examples of associated distributional effects across agricultural export industries resulting from the imposition of bans or export restrictions following non-compliance with these critical standards. Compliance with standards and the prevention of foodborne illnesses and animal/plant diseases also reinforce a country's reputation

as a reliable supplier. Outbreaks can lead to huge costs for governments and the public resulting from diagnosis and treatment of illness, production losses, outbreak investigations, and product tracebacks and recalls.⁶

POLICY ISSUES

Standards and technical regulations are used by governments as a tool to achieve broader policy objectives. The sections that follow discuss the need for a balanced approach to policy and decision making that takes domestic and international trade interests into account. Related issues involve the chaotic proliferation of private standards and their implications for national policy, the strategic uses of standards, and the question of who should provide services related to standards.

Balancing divergent policy goals and dealing with the proliferation of private standards

Policy makers often have to choose between conflicting policy goals with respect to standards and technical regulations. For example, a desire to protect human health may conflict with the desire to facilitate agricultural trade or to develop an industry or sector. The goal of expanding export markets may also conflict with the desire to conserve water or reduce pesticide use (Vapnek and Spreij 2005).

Policy making at the national or local level can be highly influenced by the international environment. Government policies should be consistent with obligations under international agreements as well as with national food security and development goals. It is generally recommended that countries adopt international standards, although their effectiveness depends on their suitability to specific national contexts. The harmonization of regional standards for raw milk in Eastern Africa is one example. Debate revolves around a desire to harmonize with Codex standards, although they do not reflect handling and consumption practices in the region (Jensen, Strychacz, and Keyser 2010).

Trade has become a driving force behind increased public and private investment in SPS and quality systems, but at the same time, many stakeholders are concerned that increasingly stringent trade standards are having adverse effects on the costs to and competitiveness of developing-country suppliers, particularly from LDCs. Consequently, in many countries, compartmentalization of production and adoption of a system of “dual standards”—one focusing on compliance with export market demands and one for local consumption—has been seen as a solution. Another concern is that the heavy emphasis on the trade benefits regarding SPS and quality

systems tends to overshadow (at least in the policy discussions) the other benefits of improved standards, such as reduced production losses and improved public health impacts on domestic populations. The challenge for policy makers is to find the right balance between these different interests and options when formulating policies and investment plans.

Another area of concern from a policy perspective is the emergence of private SPS standards. Concerns about their proliferation, prescriptive nature, legitimacy, transparency, potential to undermine public action, as well as their potential economic development impacts, have coalesced around an intense debate within the SPS committee of WTO. Concerns related to the proliferation of private social, environmental and sustainability standards are emerging as well. Discussions in several forums are intensifying over the scope of harmonization and collaboration and the need for a better understanding of intended impacts at the ground level.

Compliance with standards as a strategic issue

Some view the imposition of stricter SPS and quality requirements as a barrier to trade, especially if they entail costly, highly technical requirements or complex administrative procedures. Such requirements erode the competitiveness of industry players and further marginalize small countries, traders, and farmers.

Others view the same standards and requirements playing a catalytic role in innovation and modernization. Demands for compliance with increasingly stringent standards can expose the fragile competitiveness of an industry (or individual players) and the lack of institutional arrangements for collective action and clarify the need for action, as in Uganda's fish industry (box 6.33). This experience illustrates that innovation in response to agricultural standards and regulations is not a one-time event but part of a continual process of anticipating and responding to emerging challenges.

In several cases, industry players and governments have responded effectively to prevailing standards and have consolidated or improved their market position. In some countries, the response has involved a proactive, forward-looking strategy that seeks to reinforce their competitive advantage, as in the groundnut industry in Argentina and the horticultural industries of Peru (Diaz Rios 2007) and Kenya (Jaffee 2003). In other cases, the response has been essentially reactive, seeking to adjust in the face of adverse trade events. (see box 6.34).

The World Bank has advocated for compliance with standards to be viewed as a strategic issue, highlighting the multiple strategic options available to countries (table 6.4).

Box 6.34 Innovating to Quickly Respond to Adverse Trade Events

India's fish and fishery products: An export market lost and regained. In 1997, the European Union banned all fish and fishery products from India due to noncompliance with hygienic standards. The Indian government improved hygiene by requiring measures such as integrating preprocessing operations with processing facilities and imposing strict limits on approved output according to plants' capacities for water, ice making, and effluent treatment. The government implemented programs to support improved hygienic controls in fish processing, including subsidy programs for upgrading processing facilities and training managers and workers throughout the supply chain. Fish exporters acted collectively to establish infrastructure that would link preprocessing units to common water, ice, and effluent facilities. The new facilities include modern laboratories that perform all microbial and chemical tests required by importers. These measures led the European Union to lift the ban on imports.

Source: World Bank 2005.

Peruvian asparagus exports: Success through standards. In 1997, when Spanish health authorities asserted that consumption of canned Peruvian asparagus caused two cases of botulism poisoning, the resulting public scare in European markets created large market losses for Peruvian asparagus exporters. Seeing that even one careless exporter could disrupt the markets, the government and industry decided to take action to bring Peruvian agricultural standards in line with international norms. In 1998, the Peruvian Commission for Export Promotion convinced the asparagus industry to implement the Codex code of practice on food hygiene. Government specialists worked with the companies to ensure proper implementation. 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 necessary skills and experience to gain certification under the stringent international standards.

Table 6.4 Strategic Choices and Responses with Respect to SPS and Quality Standards

Nature of the response	Strategy		
	Exit	Voice	Compliance
Reactive	Wait for standards and give up	Complain when standards are applied	Wait for standards and then comply
Proactive	Anticipate standards and leave particular markets	Participate in standard creation or negotiate before standards are applied	Participate in standard creation or negotiate before standards are applied
Viability	Exit	Voice	Compliance
Size of firm or industry		++	+
Share of target market	–	++	+
Reputation	–	++	+
Suitability of legal/regulatory framework		++	+
Leadership/coordination within value chain		+	++
Private sector management/technical capacity	+	+	++
Public sector administrative/technical capacities	+	++	++
Clarity of institutional responsibilities		+	+
Geographical/agro-climatic conditions	–/+		–/+
Prevailing challenges	++	–	–/+
Nature of the measure		–/+	–/+

Source: World Bank 2005.

Those options will vary for each country, depending on its economic, political, and social systems and norms, institutional structure, size and location, and so on.

Who provides services related to standards?

Perhaps the most important decision to be made with respect to building capacities related to standards is whether capacity building should be done by the public or private sector. There is certainly an increasing recognition of the critical role that the private sector can play in providing services traditionally viewed as the responsibility of the public sector. In countries where demand for certain standard-related services is high, the private sector may have an opportunity to provide them. Before building, equipping, and maintaining laboratories and other standard compliance-related services, public actors need to consider alternatives. In some instances public authorities have delegated compliance services to private organizations, particularly accreditation, testing, and certification services (for example, public authorities certify compliance on the basis of testing services provided by private laboratories).

LESSONS LEARNED

Standards represent major challenges for developing countries, yet isolated improvements and innovations offer limited opportunities to leverage long-term benefits. A *key lesson* is that countries must be *strategic and proactive*. What is required is a process of strategic planning, supported by continual innovation and improvement, to successfully overcome challenges and take advantage of new opportunities. A proactive stance rests upon public and private awareness of the issues and strong governance.

Quite often, developing countries have a long list of needs for capacity development. Efforts to develop capacity related to standards should aim at maximizing the strategic options available, consider costs/benefits, speed of implementation, sustainability, complementarities between the public and private sectors, and the possibilities for regional collaboration. Certainly one of the “nonregrettable” investments in this domain would be to invest in creating broader public and private awareness of SPS and quality management issues. The sections that follow expand on these points.

Priority setting is essential for effectively managing standard-related challenges and opportunities

Pragmatism is needed when examining the state of a country’s SPS and quality-related capacity, and realism is needed

to determine the immediate and long-term scope for enhancing that capacity. Prioritization can begin with identifying the most immediate and/or significant risks as well as opportunities for competitive or welfare gains. Policy makers need to weigh the different objectives and their potential distributional impacts, but all too often priorities are driven by the benefits associated with competitive repositioning of industries/sectors or access to remunerative export markets. As challenging as it may be, it is fundamental to consider holistic approaches that merge domestic and trade perspectives, perhaps through strategic prioritization at the national, sectoral, or industry level with stakeholders.

Effective regulatory and voluntary interventions require public and private involvement

The development and enforcement of policies related to standards are enhanced by leveraging support from the private sector and/or creating an enabling environment (incentives) for private investments in capacity related to SPS and quality standards. The conditions for effective coregulatory approaches should be analyzed and explored, as they represent a potential opportunity for public and private collaboration.

Assess the gaps between local and international standards to determine the investments needed to bridge them

From a market perspective, the structure and maturity of an industry should drive the design of public and private interventions related to standards. The first step is to assess the gaps that need to be bridged. The product and the type of market provide a good indicator of the standard-related challenges. Public and private actors will need to make distinct adjustments and investments to meet stricter food safety, quality, and other requirements. Time, significant investments, and incremental upgrades are all needed for an industry to become an effective and competitive supplier in more demanding markets.

Consider the needs of vulnerable groups

New or more stringent standards are likely to pose compliance problems for firms and farms operating under less favorable conditions. An awareness of the distributional effects of standards and their influence on poverty is critical for understanding the strategic choices available to different

actors and identifying the most appropriate tools to support them in implementing those choices.

Learn from others, cooperate nationally and regionally, and search for funds to develop capacity

Given the complexity of standards, it is fundamental for policy makers from developing countries to engage in activities where they can influence the setting of public and private standards. Leadership and proactive involvement in initiatives at the regional level are critical. Regional initiatives to

harmonize standards addressing common (and cross-border) SPS issues should receive strong consideration from policy makers. Involvement in communities of practice, networks, and forums that promote common learning and information sharing is essential. Examples include the activities undertaken by the Standards Trade and Development Facility, other development partners, and international standard-setting organizations. For voluntary standards in agriculture and agrifood, new spaces for knowledge exchange and learning are emerging, such as the Trade Standards Practitioners Network.