

# ASSESSING THE DEMAND FOR FOOD SAFETY AND QUALITY IN AGRI-FOOD CHAINS



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# Assessing the Demand for Trade-Related Food safety and Quality Interventions in Agri-Food Chains

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## 1. Introduction

The evolution of technical regulations and standards in the area of food safety and quality are of great concern to donors aiming to provide support for the establishment and/or enhancement of agri-food exports, notably to higher-value markets.<sup>4</sup> In turn, significant investments have been made in the upgrading of capacity directed at achieving and/or demonstrating compliance, both within the public and private sectors. In many countries, however, it is not evident that past investments have resulted in substantive and/or sustainable improvements in compliance services, while significant capacity-building needs remain. In the context of resource limitations, there is a need to scrutinize better where and how future investments are made. This note aims to provide some guidance to decision-makers in this regard.

This note provides a brief overview of the nature of safety and quality in agri-food value chains and their links to systems of technical regulations and standards, and associated compliance and conformity assessment services. It aims to enable decision-makers to ask pertinent questions when faced with evident compliance challenges and/or demands for investments in food safety or quality compliance services. As a guide to the reader, the key take away messages are summarized below:

- Understanding standards and quality is vital. The economic perspective dictates that quality is a matching issue. The demand for quality must be matched with the supply. A mismatch occurs if the quality is too high or too low. Technical perspectives often lead to poor investments, because they tend to focus on higher or more advanced levels of quality without proper investigation of whether this level is backed by demand.
- There are wide variations in the demand for food safety and quality within and across industrialized country markets, reflected in distinct technical regulations and standards. It is necessary to understand which technical regulations and standards exporters are

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<sup>4</sup> World Bank (2005)

required to comply with in their target markets. Not all markets, and indeed the minority, require compliance with the most exacting requirements, such as GlobalGAP.<sup>5</sup>

- The gap between compliance capacity in developed and developing countries may be immense. While many developing countries have a long ‘wish list’ of capacity-building needs, it is important that efforts to build the supply of compliance services are demand-driven. Demand is based on fundamental drivers. These drivers include income, tastes and preferences, climate, consumption patterns, trade structure, regulatory and political backgrounds, and many other factors. When the drivers differ between two countries the demand will differ. Therefore, capacity enhancing efforts must differ too.
- There are typically multiple options for where and how to establish compliance capacities, although some of these might not be immediately recognized by stakeholders in the target country. These options can vary in their cost, speed of implementation, sustainability, etc. In this regard, it is important to consider carefully the roles of the public and private sectors.
- Thus, developing countries face choices when addressing the challenging technical regulations and standards in the area of food safety and quality. Non-compliance may be an option, because markets with less strict requirements likely exist. If compliance is the chosen route, this can generally be achieved in a variety of ways.<sup>6</sup> The route that is chosen should offer the best opportunities for appreciable gains in capacity that are sustainable and support market competitiveness.
- Several approaches can be pursued to enhance compliance capacities. Options may include addressing gaps in compliance services and in the overall enabling environment for compliance, including: enhancing regulatory frameworks, supporting reforms of institutional structures and responsibilities, strengthening institutional capacities for inspection and conformity assessment, establishing national standards, etc. Options may also include supporting directly the process of upgrading at the farm/firm level, through the adoption of improved production and postharvest practices or by strengthening public/private platforms for consensus building and advocacy roles. This paper will discuss the challenges associated specifically with the provision of compliance services.

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<sup>5</sup> GlobalGAP, formerly EurepGAP, is a private sector body that sets voluntary standards for the certification of agricultural products around the globe.

<sup>6</sup> The World Bank (2005) highlights the set of strategic options available to exporters/industries in the face of compliance challenges. Options may include: comply; comply but exercise voice to level the “playing field” through for example enhanced participation in public and private standard setting and; shift toward less stringent markets.

If further information is required on any of the points made in this note, the reader is directed to the referenced sources. Generally, references have been kept to a minimum and consist of those sources considered to be of most immediate value.

## **2. Role of quality in agro-food value chains**

Over time, consumer demand trends in industrialized countries have acted to put greater focus on product safety and quality over price considerations. There is also evidence that comparable changes in consumer demand are taking place among higher-income groups in some developing countries.<sup>7</sup> On the one hand, despite major advances in agricultural and food technology and scientific understanding of the risks associated with food, consumer concerns about food safety persist. Indeed, high profile ‘food scares’ in a number of industrialized countries have served to fuel consumer concerns and erode confidence in prevailing mechanisms of food safety control.<sup>8</sup> Paradoxically, some advances in food technology (for example irradiation and genetic-modification) have fueled consumer concerns. On the other hand, consumers are increasingly focused on a broader array of product and process attributes when assessing food quality. These quality attributes encompass the manner in which products are produced (for example agricultural production methods), product constituents that are perceived to be unhealthy (for example fat or cholesterol) and the wider impacts of the agri-food chain on the environment, worker welfare, animal welfare, etc. Thus, agricultural and food products are increasingly viewed as a complex array of quality attributes that are packaged together in differing combinations and quantities, many of which cannot be directly observed at the point of purchase or even post-consumption.

Profound changes are also taking place in the structure and *modus operandi* of global agri-food value chains, such that demand patterns in industrialized and/or among richer consumers are of global significance. Supply chains for agricultural and food products are progressively extending beyond national and regional boundaries, facilitated in part by new food, communications and transportation technologies, and a policy environment that encourages more international trade.<sup>9</sup> Along these supply chains, ownership is increasingly concentrated among a diminishing number of key economic players having power over global agri-food markets. In particular, concentration within food retailing and food service is driving a shift towards buyer-driven supply chains<sup>10</sup> that are extending internationally with global sourcing. The ways in which dominant firms compete is also changing, with increased emphasis on product quality attributes as a means to product differentiation.<sup>11</sup> Indeed, it is argued that

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<sup>7</sup> Henson and Reardon (2005). Recent evidence is showing that these changes are likely to proceed much more slowly than once thought in Sub-Saharan Africa, particularly in fresh produce supply chains (Tschirley et al, 2009).

<sup>8</sup> Jaffee and Henson (2004)

<sup>9</sup> Henson and Reardon (2005)

<sup>10</sup> Humphrey and Schmidt (2001)

<sup>11</sup> Busch and Bain (2004)

the very ways in which agricultural and food markets are structured and/or operate are progressively defined more by quality-based rather than price-based competition.

While we observe a general trend towards increased consumer concerns about food safety and quality and the growing prominence of quality-based competition in food markets, there remain significant differences in the level and/or nature of these concerns and their impact on consumer demand across products, markets and/or consumers. Thus, there are substantial markets that are predominantly driven by price and only very basic food safety and quality considerations; most emerging markets fall into this category. Even in markets where a wider range of food safety and quality concerns are more to the fore, the relative importance of particular issues varies widely. Such variation is seen across countries and regions (for example in the demand for Fair Trade, organic products, and products holding sustainability claims in Europe and the United States) and between consumer sub-groups within countries (for example between customers of high-end supermarkets and of discount supermarkets and local stores in the United Kingdom). Overall, therefore, we observe a spectrum of markets in terms of food safety and quality requirements (Figure 1) both across and within developing and industrialized countries, with those that are most exacting being the exception rather than the rule.

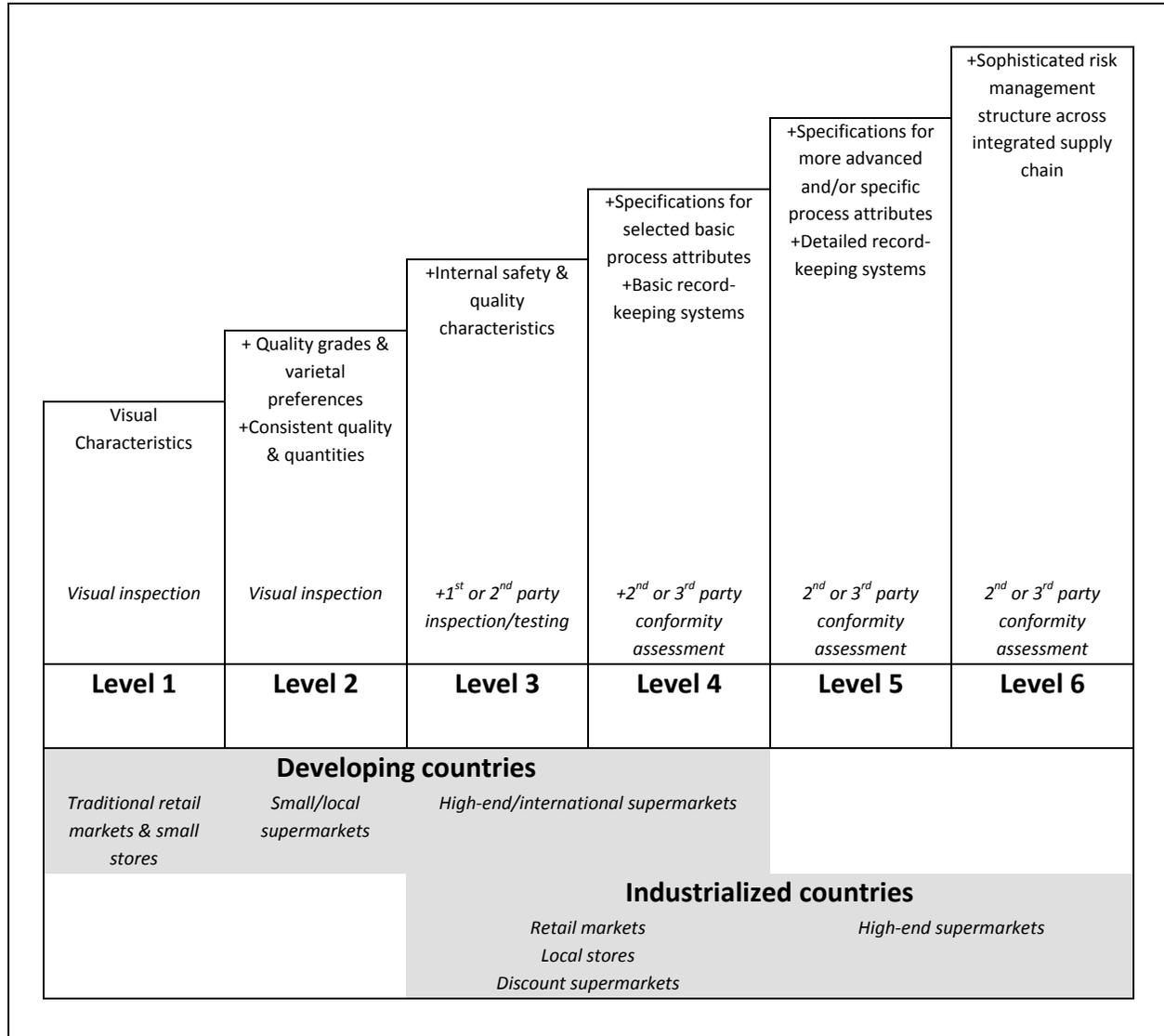
Many developing country markets continue to function in the same way as they have for decades, if not centuries. It is easy to overestimate the importance of changes in agro-food production, trade and consumption from reading academic and policy literature which is mainly focused on new, high profile topics originating in developed countries and in a few selected 'high-end' market segments in more advanced developing countries. Nevertheless, these changes sometimes filter down to the poorest countries' supply chains when these target high-end markets. One contemplating policy initiatives in agro-food markets must therefore evaluate carefully the targeted market's requirements and compare these with the capacities and costs of a given supply chain. In the context of international trade, it is recommended that quality is viewed through an economic lenses where the ultimate goal is to match the expectations (and so the buying power) of consumers with the capacities and cost structures of the supplier, rather than to aim automatically for the highest quality technically possible.

### **3. Production and maintenance of quality through supply chains**

The increasing focus on food safety and quality attributes has served to highlight the role of product and process controls in developed countries agro-food value chains. New practices and standards have spilled over into developing countries in three ways. First, a large number of developing countries export to Northern markets, including for higher-value products like horticulture and seafood for which the new quality focus is particularly pertinent. Second, food safety and quality-focused regulation has been under reform throughout the last decade or two. The design of developing country reforms often finds heavy inspiration in developed

country models. Finally, donor agencies and international organizations are providing increasing levels of assistance to quality and standards issues in developed countries, which are predominantly based on developed country models.

**Figure 1. Spectrum of food safety and quality requirements for agri-food products**



Source. World Bank-University of Guelph. "Conceptual Framework of the Ongoing Project Facilitating the Access of Small-Scale Producers to High-Value Markets" (Forthcoming)

This section therefore discusses quality interventions and policies with a strong focus on developed country development. Anybody contemplating developing country initiatives must consider seriously how alike the context he or she is working in is to the developed country environments for which many initiatives have already been designed and implemented. For example, many food safety measures have emerged as responses to food scares in developed

countries. Some initiatives are highly prescriptive in their choice of instruments to achieve a particular level of food safety. The instruments reflect developed country best practice and may fail to take into account the range of instruments which are available in developing countries. There is a risk that very prescriptive measures fail to achieve the desired level of food safety protection in a cost effective way. Likewise, there is a risk that the use of measures designed for developed countries lead to an underestimation of the costs of applying such measures in developing countries.

It is important to recognize that food system regulation has two sides and that these sides are, or should be, complimentary. On the one hand, public authorities regulate the food system in pursuit of social food safety and quality objectives. On the other, the private sector manages production, manufacturing and distribution processes along value chains in order to meet the market demands of consumers and pressures of civil society organizations, in so doing, maintain and/or enhance their competitive position. Thus, governments and the private sector have responded to changes in consumer demand through a series of institutional adaptations that have collectively yielded a new paradigm in food safety and quality regulation and management.

In the area of food safety, for example, in many industrialized countries, technical regulations have been revised and significant institutional changes made in the oversight of food safety, including the implementation of process and performance-based approaches such as hazard analysis and critical control point (HACCP) (see below) and a focus on the entire supply chain, for example through requirements for traceability.<sup>12</sup> Certainly, there is now enhanced regulatory oversight of food supply chains, reflected in the greater incidence of official food safety measures across WTO Member countries. In many cases, technical regulations have been tightened on foods that have long raised safety concerns (for example *Salmonella* and *Campylobacter* in meat), while new official controls have been implemented for emerging hazards and/or in areas that were previously less regulated (for example mycotoxins). With respect to food quality, technical regulations and/or public standards have been promulgated to ensure fair competition and/or to prevent consumers from being misled, for example through the institution of public standards for organic products. Thus, there has been a general shift from left to right in Figure 1, although with substantial differences remaining across countries.

In parallel, the private sector has made efforts to address consumer concerns and to harness these concerns as a means to compete in food safety and quality-defined markets. Much of the motivation here has been the mitigation of reputational and/or commercial risks associated with the safety of food products, alongside quality-based modes of product differentiation.<sup>13</sup> This reflects the considerable challenges in ensuring that food safety and

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<sup>12</sup> Jaffee and Henson (2004); Caswell *et al.* (1998).

<sup>13</sup> Henson and Humphrey (2009)

quality attributes are produced and maintained through global agri-food value chains, notably where these cut across differing regulatory jurisdictions, agro-climatic conditions, economic and political norms, etc. Thus, private food safety and quality standards have been promulgated by individual and/or coalitions of firms— a sub-set of private standards, particularly related to sustainability claims, have been led by NGOs or coalitions of private firms, NGOs and development partners . Examples of firm-led initiatives include GlobalGAP, BRC Global Standard for Food Safety, International Food Standard (IFS), SQF 1000/2000, Tesco's Nature's Choice, etc,<sup>14</sup> which lie towards the right hand-side of Figure 1. While the development and adoption of these standards was initially driven by the major European food retailers, food manufacturers and food service operators have recently become more active, not only in Europe but in other industrialized regions.

Both reflecting and supporting the promulgation of private food safety and quality standards has been the development of meta-systems such as HACCP, good manufacturing practice (GMP), good agricultural practice (GAP), ISO 9000, etc.<sup>15</sup> Some of these meta-systems are embedded in voluntary public standards at the national and/or international levels (for example ISO 22000) and may not be specific to agricultural and food products (for example ISO 9000), or are the basis of propriety private standards (for example GlobalGAP, BRC Global Standard for Food Safety, IFS and SQF 2000). Such meta-systems can be viewed as 'codes of conduct' for the agri-food system in achieving a particular bundle of food safety or quality attributes and the allied processes of system-based conformity assessment. Increasingly, such codes govern the way in which the entire supply chain operates, from primary production through to retail distribution. At the same time, the evolution of these meta-systems has been both stimulated and facilitated by the development of a multi-tiered system of conformity assessment based around certification and accreditation.<sup>16</sup> Thus, contemporary agri-food systems are governed not only by technical regulations and private standards, but also by public and private modes of enforcement. It is not unsurprising, therefore, that a key driver behind the promulgation of private standards has been the evolution of technical regulations, whereby private standards lay down a 'road map' towards regulatory compliance that minimizes the attendant costs and risks for food suppliers.

The net result of efforts by governments and the private sector to establish an institutional framework for the management of food safety and quality has been to lay down a complex and inter-related web of technical regulations and standards that variously govern particular product or process attributes. Just as the food safety and quality demands of consumers differ across countries, markets and products, so do the attendant systems of technical regulations and standards (Figure 1). Taking horticultural products as an example, in

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<sup>14</sup> Henson (2007)

<sup>15</sup> Henson (2007)

<sup>16</sup> Busch *et al.* (2005)

some markets there may be highly specific and detailed process requirements (for example on GAP), laid down by technical regulations and/or standards with related systems of 2<sup>nd</sup> or 3<sup>rd</sup> party certification. This corresponds to Levels 5 and 6 in Figure 1 and is found predominantly in value chains to high-end supermarkets in industrialized countries. In other markets, however, including local stores in industrialized countries and most supermarkets in developing countries (Levels 2 and 3 in Figure 1), relevant food safety and quality parameters will be restricted to those that can be assessed visually or through relatively simple tests on the product itself. In such markets, little or no concern is given to processes further up the value chain, for example the application of GAP or traceability.

From the perspective of developing country exporters, this presents a portfolio of markets that differ in the technical regulations and standards with which compliance is required. Table 1 provides the example of Ghanaian fresh fruit and vegetables directed at domestic and export markets. Other exporters of fresh produce in sub-Saharan Africa, for example, would face a similar compliance profile. Most of Ghana's fresh vegetable exports are to markets at Levels 2 or 3 (mainly wholesale markets in the UK), while there has been a progressive shift of pineapple exports from markets at Levels 2 and 3 (mainly European wholesale trade) to those at Levels 4 or 5 (mainly European supermarkets). In contrast, most of Kenya's fresh vegetable exports are to markets at Levels 4 through 6 (mainly UK supermarkets). The key point is that countries and exporters therein face strategic choices. For example, make the often appreciable (and costly) investments in order to comply with the exacting requirements of exacting and often higher-value markets, or instead target markets where technical regulations and/or private standards are less challenging, but price competition may also be more fierce. Of course, such decisions should be made on the basis of the competitive position of the firm; compliance decisions are simply a sub-set of the wider business choices faced by exporters.

Noteworthy in Table 1 is the requirements of domestic/regional supermarkets in Ghana.<sup>17</sup> As with much of sub-Saharan Africa, the food safety requirements of supermarkets are quite relaxed, and certainly have little in common with supermarkets in industrialized countries. While international supermarket chains investing in developing countries have rather stricter requirements, these are more at Levels 3 and 4 of Figure 1 rather than Levels 5 or 6. This is certainly a rather different message to much of the discourse on the 'supermarket revolution' in developing countries.<sup>18</sup> The different nature of domestic supermarkets provides producers an alternative outlet to more exacting high end export markets. The existence of multiple markets with different quality requirements and cost structures leads us naturally into the crucial discussion of how best, from a development perspective, to match demand for quality with the costs of supplying it.

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<sup>17</sup> See OECD(2006) for more details

<sup>18</sup> See for example Reardon *et al.* (2003); Henson and Reardon (2005)

#### **4. Food safety and quality compliance services – matching demand with supply**

The ability of developing countries and exporting firms therein to comply with technical regulations and standards for food safety and quality is dependent on both the capacity to conform to such requirements and the capacity to provide evidence of conformity.<sup>19</sup> We describe each of these capacities in turn below.

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<sup>19</sup> UNIDO (2003)

**Table 1. Food safety and quality standards applied to Ghanaian fresh fruit and vegetables**

Standard	UK Supermarkets	Dutch German/Swiss Supermarkets	Other Continental European Supermarkets	Export Wholesale Markets	Regional Markets	Domestic/Regional Supermarkets in Ghana	Domestic Traditional Markets
Phytosanitary certificate	LLL -	LLL -	LLL -	LLL -	L -	- -	- -
Limits on pesticide residues	LL PPP	LL PP	LL P	- -	L -	L P	L -
HACCP	- PP	- PP	- P	- -	- -	- -	- -
Traceability	- PPP	- PP	- P	- -	- -	- -	- -
Microbial contamination	- PPP	- PP	- P	- -	- -	L P	L -
Good agricultural practice	L PPP	L PP	L P	L -	- -	- -	- -
Social welfare conditions	- PP	- P	- -	- -	- -	- -	- -
Quality grades	L PPP	L PP	L PP	L P	- -	- P	- -

**Key:** LLL: Technical regulations strictly enforced  
 LL: Technical regulations with some enforcement  
 L: Technical regulations with minimal enforcement  
 -: No Technical regulations  
 PPP: Strict private standards  
 PP: Some private standards  
 P: Weak/minimal private standards  
 -: No private standards

Source: OECD (2007)

Note: First line relates to official regulations; the second to private standards.

The increasing prevalence and stringency of technical regulations and standards can overwhelm the limited technical capacities of the public and/or private sectors in many developing countries, especially smaller and poorer countries, and where exports are nascent. Not only must they be able to monitor changes in the standards landscape and to formulate appropriate plans for compliance, but also employ the necessary financial, technical and human resources to implement and operate the required capacities. More 'traditional' elements of capacity are needed, for example testing laboratories, metrology services and the upgrading of production and manufacturing processes. At the same time, with the increasing role of meta-standards such as HACCP and traceability, changes may be required in the structure and *modus operandi* of value chains.

Achieving compliance with technical regulations and standards in international trade is generally not sufficient, it is also necessary to demonstrate that compliance has been achieved. This may be called "assured compliance." Where systems of conformity assessment are weak, access to international markets may be blocked, inordinate levels of official or buyer rejections can diminish competitiveness and/or buyers may offset the additional risks they face through price discounts. Conformity assessment services can lie within the public sector, as with systems of official certification, or within the private sector, as with many systems of second- and third-party certification. All such systems must themselves comply with international standards or the standards applied by the importing country. Indeed, in some cases such systems of conformity assessment require the prior approval of the importing country.

A range of services are associated with compliance and conformity assessment including testing, metrology, system certification, inspection, traceability, packaging and labeling. Table 2 details examples of requirements for exporters and the institutional mechanisms or infrastructure to support and assure that compliance has been achieved. In addition to these core compliance services, firms may be assisted by consultancy and training services, demonstration facilities, etc., that impart knowledge and technologies that are necessary for effective and efficient compliance. In many cases, this portfolio of services and related infrastructure can be situated in the public or private sectors or, alternatively it can be provided by external service providers under contract, fee for service or other arrangements.

Underlying the provision of compliance services is the necessary standards, metrology, testing and quality infrastructure. Whereas, this infrastructure is taken for granted in industrialized countries, in many developing countries critical elements may be missing or weak. The key 'building blocks' are as follows:

- A national standards body which is responsible for standards formulation and dissemination. Such standards can be product or process-based. Exporters may also require system certification to meta-standards such as ISO 9000, ISO 14000, HACCP, etc.

**Table 2. Examples of elements of compliance and assurance of conformity**

<b>Compliance Area</b>	<b>Needs of the Exporter</b>	<b>Necessary Services</b>	<b>Service provider</b>
Product standards/technical regulations, including packaging and labeling	Access to standards/technical regulations	Reference centre in standards body or other	National standards body Private service providers Private buyers
Product testing	Conformity assessment recognized by the (international) client	Testing laboratory upgrading towards internationally recognized accreditation, Mutual Recognition Agreements	Domestic private laboratories Foreign private laboratories Laboratories accessed through buyers Public laboratories
Accuracy of measurement	Internationally recognized equipment calibration, measurement traceability to SI (measurement) standard	Metrology laboratory upgrading towards internationally recognized accreditation, inter-calibration schemes	National laboratories Foreign laboratories
Consistent product characteristics and quality	Enterprise Quality Management System Certification (ISO 9000)	Certification capacity and internationally recognized certifiers	Domestic private service providers Foreign private service providers
Management of environmental impact	Enterprise Environmental Management System Certification (ISO 14000)	Certification capacity and internationally recognized certifiers	Domestic private service providers Foreign private service providers
Food safety	Management system to control food contamination (HACCP)	Certification capacity and internationally recognized certifiers. Laboratory/testing capability	Domestic private service providers Foreign private service providers

Social accountability	Insurance of consumer concerns relating to child labor, workers exploitation etc (e.g. SA8000, the Base Code)	Certification capacity and internationally recognized certifiers	Domestic private service providers Foreign private service providers
Examinations of shipment content to order	Product Inspection	Development of cross border inspection services	Domestic private service providers Foreign private service providers
Traceability of products and inputs from farm to fork	Traceability system	Development of consultancy capacity and internationally recognized certifiers	Domestic private service providers Foreign private service providers

- Laboratories for product testing are required for effective consumer protection in domestic markets and for export product testing. Such services in the areas of chemical, microbiological and physical testing are generally provided by laboratories external to the exporter, whether in the public or private sectors. Laboratories must generally obtain international recognition or accreditation to ensure international acceptance of the certificates they issue and to avoid duplicative testing in the importing country.
- Metrology services ensure the accuracy and international acceptance of local results and conformity with defined product standards. Thus, measuring tools, equipment, process machinery and laboratory testing apparatus need to be regularly calibrated to ensure that measurement traceability to the International System of Units (SI) is maintained.
- In order to provide system certification, the country needs to have certification bodies that are recognized by importing countries and/or buyers. Certification services can be provided by the national standards body<sup>20</sup> or by other public institution and/or autonomous private organizations that have been accredited to perform these functions.
- National accreditation body, which is responsible for accrediting laboratories, system certifiers and inspection bodies. Through international peer evaluation, the national

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<sup>20</sup> Overall, differentiation is desirable between standard-setting and certification functions. Where a single organization develops standards and undertakes certification, there is a significant risk that the blurring of responsibilities and insufficient separation of functions will lead to conflict of interest.

accreditation body can achieve international recognition of local laboratory and/or system certification.

The above elements operate as a systemic whole and a certain minimum level of capacity is required for each in order to ensure that reliable and credible compliance services are provided. This requires that the ability to undertake compliance services is appraised holistically, rather than focusing on specific elements of capacity piece-by-piece. For example, a standards body establishes standards, the metrology service ensures testing equipment is properly calibrated and accredited laboratories and/or certification bodies assess conformity. If any element of this infrastructure is missing or weak, compliance services may not be recognized internationally. There is an argument that the minimum level of infrastructure, that forms the basis of all compliance services, should be regarded as a public good and thus a legitimate focus for public investment. However, any investment plan should take note of the fact that there is no one-size-fits-all solution to the configuration of the quality infrastructure. Any quality infrastructure will involve a mixture of public and private services as well as a balance between domestically produced and imported services. For example, regional cooperation may be a cost effective way of addressing needs in fields such as accreditation and metrology rather than relying on national solutions in particular in low income countries.

Most investments in infrastructure can be regarded as discretionary. Capacity to deliver these enhanced conformity services should be demand-driven, reflecting the requirements of domestic consumers and the needs of exporters in order to comply with requirements in a manner that maintains or enhances export competitiveness. Reflecting this, we generally see compliance service and capacities increasing with country size, level of economic development, existing and expected future exports, etc. At the same time, however, where vibrant exports sectors are observed in less-developed countries, there may be exceptional demands for compliance services that are highly sector-specific. Here, 'islands' of enhanced capacity may need to be established that support these 'exceptional' sectors, within a broader context of relatively weak capacity.

The foregoing discussion suggests that processes of enhancement of compliance capacities and associated services should quite closely follow the evolution of demand for these services. If the supply of compliance services appreciably outstrips demand, any excess capacity will essentially be unused and the underlying fixed costs of maintaining this capacity will almost inevitably fall on the public sector or donors. At the same time, it is desirable to avoid the situation where the supply of compliance services appreciably lags behind demand; in such circumstances, weaknesses in the ability to deliver compliance services can be a serious impediment to export growth and competitiveness. Of course, ensuring that the supply of compliance services 'shadows' demand is not easy, and at least short periods of over and under-capacity are unavoidable.

## 5. Assessing food safety and quality interventions

This section provides a checklist of questions that a development practitioner should ask during the planning process for a food safety and quality intervention in a developing country.

These issues are presented as a series of questions, broadly ordered sequentially, that might be considered in determining:

- What the alternatives are for producing agro-foods of different qualities?
- Whether a particular compliance service is required and is economically-viable given current and prospective demand for the service?
- What is the best way in which to establish and/or deliver this compliance service?
- Where this compliance service might be best situated?
- Whether the compliance service capacity is likely to be sustainable in the medium and long term?
- How all this information feeds into a strategy for securing the desired level of quality?

The series of questions is presented in Figure 3 and described in more detail in the text below.

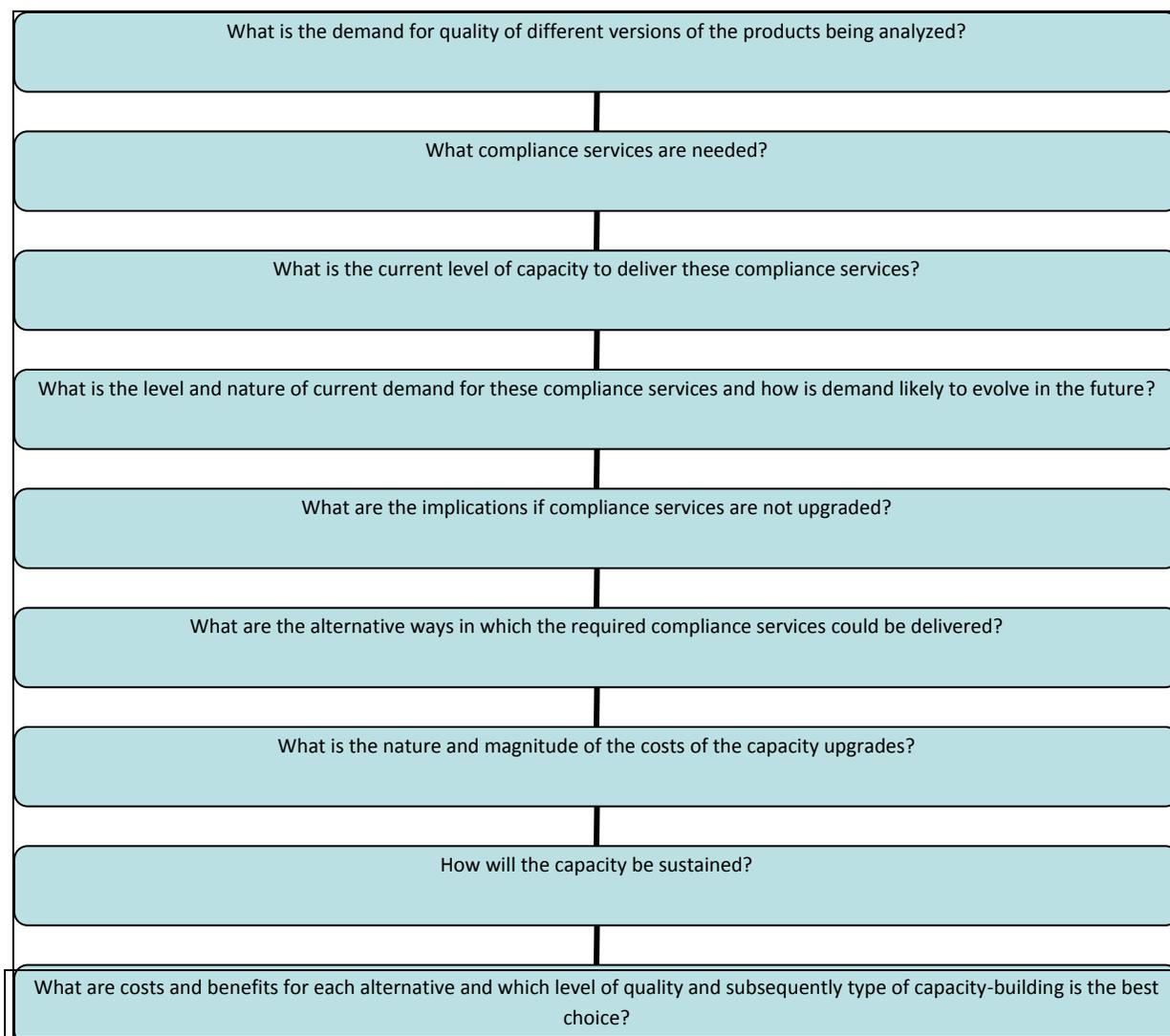
### ***What is the demand for quality of different versions of the products being analyzed?***

Any agro-food product may come in a variety of forms. Commercially speaking, fresh green beans with a traceability record are a very different product than those without, and fresh fish is different from frozen fish despite the raw materials or base product being the same. The costs structures of producing different versions of the product will vary, as will capacity-building needs and the nature of the capacity to be installed (for example, a privately-run self-checking quality control system as opposed to systems based on government inspections). It is therefore important that the range of products that the country could potentially produce (including their potential variations in quality) is established.

### ***What compliance services are needed?***

The first stage of the assessment is directed at identifying the specific compliance services that are needed on the basis of the products that potentially could be in demand. Such services might be associated with support to exporters in achieving compliance and/or undertaking conformity assessment, as described in the previous section. In part, conformity service needs may be self-evident from technical regulations and/or standards in export markets, for example if these stipulate a particular testing regime. Alternatively, there might be considerable latitude for public authorities or private firms to select a particular route to compliance and conformity assessment. In the latter case, attention needs to be given to the services that are strictly required for compliance versus wider aspirations for capacity development.

### **Figure 3. Critical questions in assessing compliance service needs**



The most straightforward approach to determining compliance service needs is to undertake an inventory of requirements across key export sectors.<sup>21</sup> In so doing, however, it is important to avoid ‘double counting’ through the simple addition of requirements across sectors. Many aspects of compliance services are generic such that they simultaneously meet the needs of all or most sectors. For example, a microbiological laboratory may be able to undertake tests across multiple products and/or testing parameters.

In other cases, however, compliance services are specific to particular products and/or food safety and quality parameters. For example, specialized equipment is needed to undertake tests for pesticide residues that is quite different to that required to test for heavy metals.

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<sup>21</sup> This inventory may well also include, capacity needs across key export sectors at a regional level.

The enhancement of compliance service capacity often requires that multiple and sequential investments must be made. For example, the provision of internationally-recognized laboratory tests requires not only that a country has the necessary laboratory facilities, but also the ability to accredit the laboratory in a manner that is internationally-recognized. Thus, investments may be needed in both new laboratory buildings and equipment and in laboratory staff training, but also in establishing and/or enhancing administrative arrangements for laboratory accreditation. It is important to recognize the full range of investments required, how these need to be sequenced, their individual public and private good properties, etc., with a focus on which elements of capacity are critical constraints.

***What is the current level of capacity to deliver these compliance services?***

Having determined which compliance services are needed, the logical next question is whether capacity already exists to provide these services, in a qualitative sense, at the quality and reliability required.<sup>22</sup> This may not always be immediately evident and/or local stakeholders may focus on only a sub-set of the available capacity, for example on public sector laboratories while ignoring private sector laboratory capacity. Attention needs to be given not only to whether the required compliance services are already provided, but also whether there is scope for their provision through the relatively simple reallocation of resources, retooling of facilities, etc. Thus, investments in a new laboratory may not be required if the necessary equipment is already in place, although perhaps currently used for a different type of analysis or for testing services on other products. This suggests that the scope of such an assessment needs to be wide, even though the attendant capacity service needs may be quite narrowly and/or specifically defined.

***What is the level and nature of current demand for these compliance services and how is demand likely to evolve in the future?***

Having considered *what* additional compliance services are needed, the next stage is to estimate *how much* of these services is required? In so doing, it is important to focus on the services themselves (for example the number of laboratory tests or certification audits) rather than the infrastructure that underlies the provision of these services (for example the number of laboratories or certification bodies). Thus, estimates are needed of the amount of particular services required and how demand is likely to evolve over time. Other parameters include the frequency with which these services are likely to be required and the extent to which demand is sporadic and/or predictable. Through comparison with the capacity to deliver these services, an assessment can be made of the gap in service provision, in aggregate and at particular

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<sup>22</sup> Note that organizations such as FAO have compiled toolkits that can provide valuable guidance in assessing capacity-building needs (including needs in compliance services) : See:

<ftp://ftp.fao.org/docrep/fao/010/a1142e/a1142e00.pdf>

<ftp://ftp.fao.org/docrep/fao/009/a0601e/a0601e00.pdf>

periods of time, currently and in the foreseeable future. The level of current and future demand for particular compliance services is a key factor in determining what levels of investment in capacity enhancement are justified and who can and should make such investments, notably the public or private sectors.

***What are the implications if compliance services are not upgraded?***

The benefit side of the assessment of compliance service capacity-building essentially focuses on the implications of not undertaken the identified upgrades. In extreme cases, the target country and/or key sectors therein may be excluded from existing export markets. Alternatively, plans to enter new export markets or to reposition within existing markets towards higher-value segments may be thwarted.<sup>23</sup> Although the country may be able to continue exporting without access to enhanced compliance services, firms may suffer from price discounts or their competitive position is gradually eroded over time. Here it is important to not over-attribute export performance to compliance issues; there may be many other drivers of export performance such that capacity enhancement may not translate into appreciable improvements in exports.<sup>24</sup>

Beyond the immediate impacts on export performance, it is important to consider the wider economic and social implications of decisions over investments in enhanced compliance service capacity. Key parameters here will include the impacts on marginal producers and firms, poor segments of the population, etc. If a particular sector supports significant numbers of marginal producers, for example, particular emphasis may be placed on maintaining and/or enhancing exports.<sup>25</sup>

***What are the alternative ways in which the required compliance services could be delivered?***

Having established the level of demand for the compliance services under consideration, the various options for delivering these services can be assessed. There are various dimensions to this question: 1) domestic/regional provision or international outsourcing; 2) centralized or decentralized domestic provision; 3) public or private provision. It is important to lay out the spectrum of options across these dimensions and to rigorously assess each according to their technical, administrative, logistical and economic feasibility, and also the degree to which they deliver compliance services in a manner that promotes export market competitiveness.

Where the level of demand for a particular compliance service is low and/or not considered to grow appreciably in the foreseeable future, serious consideration might be given to international out-sourcing. Certainly, there is likely to be a relatively weak case for

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<sup>23</sup> See Henson and Jaffee (2008) on strategic positioning generally and Jaffee (2003) for the specific example of Kenya.

<sup>24</sup> See Diaz Rios *et al.* (2009) for the case of the Uganda horticultural export industry.

<sup>25</sup> World Bank (2005)

substantial public investment. The use of international outsourcing clearly requires that an international provider is available within the region of the target country, or at least that a provider can be accessed in a timely manner given the speed with which the service is required to be accessed. There may also be administrative constraints on international outsourcing, for example where technical regulations in a target market require that conformity assessment is undertaken and certified by an official public authority in the exporting country. Finally, international out-sourcing, at least on a unit cost basis, is likely to be costly and requires access to foreign exchange.

If a decision is taken to establish or enhance the capacity to provide a compliance service domestically, consideration needs to be given to whether such capacity can and/or should be established centrally or be decentralized across regions of the country. Key issues here are the existence of economies of scale in service provision, the geographical distribution of service users and the immediacy with which compliance services need to be accessed.

Perhaps the most important decision to be made with respect to the enhancement of domestic compliance service capacity is whether this should be established in the public or private sectors. In principle, most compliance services can be undertaken in either sector, such that this is essentially an economic decision. For example, where the demand for compliance services is relatively low and/or not expected to grow appreciably in the foreseeable future, where such services are required infrequently and/ or where demand is sporadic or unpredictable there may be little incentive for private sector investment. Further, where compliance services are predominantly public goods, there is a strong argument for public provision given that reliance on the private sector is likely to lead to under-supply. Of course, the option for private provision of compliance services requires that firms or organizations, whether multinational or domestic, with the required skills and resources are available locally. In many low-income countries this may not be the case.

### ***What is the nature and magnitude of the costs of the capacity upgrades?***

Having established the unmet compliance service demand, it is necessary to identify the specific investments required in order to deliver these services, and the ongoing costs of service provision. If these costs, assessed over an appropriate time horizon and discounted back to a net present value (NPV), significantly outweigh the benefits of enhanced compliance service provision, questions need to be asked about the economic feasibility of pursuing such investments. This is not to say that these investments should not be made; there may be legitimate and significant social or strategic reasons for doing so. Rather, that such investment requires closer scrutiny.

Of course, there may be various ways in which the delivery of compliance services can be established and/or enhanced and these may have very different up-front and/or on-going

costs. Again, these costs need to be ‘collapsed’ into an NPV to facilitate comparison. However, it is important that investment decisions are not taken solely on the magnitude of aggregate costs. Account also needs to be taken of how the options differ in the quality of service provision, long-term sustainability (see below), etc.

As well as the costs of establishing compliance service capacity *per se*, attention needs to be given to who should make and/or is willing to make these investments. If the up-front costs are significant, there may be weak incentives for private sector investment, especially where demand for the associated compliance services is uncertain and/or sporadic. In such cases, public sector investment may be needed, or alternatively private investment may require subsidization. It is important to recognize that public investments to establish compliance service capacity do not imply that the public sector has to deliver the attendant services. Rather, arrangements might be put in place for private service providers to operate out of publically-funded facilities.

As well as the magnitude of the ongoing costs of service provision, their broader characteristics need to be examined. For example, are there significant economies of scale in service provision and how are costs likely to evolve over time? Key here is the scope for maximizing efficiency in service provision, both through the initial design and implementation of capacity and on-going learning and adjustment processes.

### ***How will the capacity be sustained?***

Before embarking on efforts to enhance compliance service capacity, serious attention needs to be given to how this capacity will be sustained in the medium and long term, both technically and economically. Too often, sustainability is only considered once capacity has actually been enhanced, such that there are numerous examples in developing countries of such facilities becoming obsolete. Key issues here include the role of the public and private sectors in service provision, whether public provision is on a full or partial cost-recovery basis, the degree of public subsidy of private service provision, etc. In turn, consideration needs to be given to the scope for exporters to bear the full cost of compliance services given their competitive position in export markets and the cost efficiency of service provision. If the export sector is of great economic and/or social significance, at least partial subsidy may be considered legitimate, although there needs to be clear evidence of political impetus to maintain this subsidy over time.

### ***What are the costs and benefits for each alternative product and which level of quality and subsequently type of capacity building is the best choice?***

Running through the above list of questions is likely to be an iterative process where different products and their quality variations are considered and compared with respect to the parameters established above. The whole process should allow the development practitioner to make an informed strategic choice of which quality segments to target and in which way(s).

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