

INTERNATIONAL DEVELOPMENT IN PRACTICE

Kyrgyz Republic

QI Toolkit Case Studies

Martin Kellermann

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Abbreviations

BIPM	International Bureau of Weights and Measures
CIS	Commonwealth of Independent States
CMC	calibration and measurement capabilities
COOMET	Euro-Asian Cooperation of National Metrological Institutions
CSM	Centre for Standardization and Metrology
GDP	gross domestic product
GOST	State Standard (Russian: ГОСТ - государственный стандарт)
HACCP	hazard analysis and critical control points
IEC	International Electrotechnical Commission
ILAC	International Laboratory Accreditation Cooperation
ISO	International Organization for Standardization
ITC	International Trade Centre
KCA	Kyrgyz Centre for Accreditation
MITT	Ministry of Industry, Trade and Tourism
MRA	Mutual Recognition Arrangement
NISM	National Institution for Standards and Metrology
PTB	National Metrology Institute of Germany (Physikalisch-Technische Bundesanstalt)
QI	quality infrastructure
RTBET	Reducing Technical Barriers for Entrepreneurship and Trade
SECO	State Secretariat for Economic Affairs (Switzerland)
SI	International System of Units
USAID	U.S. Agency for International Development
WTO	World Trade Organization

Kyrgyz Republic

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Abstract: The Kyrgyz Republic drastically reengineered its quality infrastructure (QI), driven by the need to secure new export markets for its products after the demise of the Soviet Union, which had been its major trading partner. The Soviet-style control of industry through nearly 23,000 mandatory standards was changed into a modern technical regulation regime. The national standards body was relieved of its responsibility to administer the mandatory standards through mandatory product certification, and this was replaced by a market surveillance system, which became the responsibility of relevant ministries. A national accreditation body was established, and it pursued international recognition. Testing and certification for technical regulation was liberalized, but with the proviso that conformity assessment service providers had to be accredited. The national metrology institute was upgraded and international recognition was sought through International Bureau of Weights and Measures (BIPM) processes.

EXECUTIVE SUMMARY

After the demise of the Soviet Union in the 1990s, the Kyrgyz Republic became independent and had to integrate into the world economy. Kyrgyz policy makers embarked on a series of reforms to make this possible. The reform of the country's quality infrastructure (QI) became part of its overall reform program. At independence, the QI was modeled on that of the Soviet Union; that is, a single organization, Kyrgyzstandart, was responsible for standards, metrology, authorization (a form of accreditation), and conformity assessment. Furthermore, all 23,000 state standards (referred to as GOST standards, further discussed in the "Background of QI Issues" section) were deemed mandatory, and Kyrgyzstandart was responsible for ensuring their implementation and compliance by industry. In many cases, the standards were outdated, and the system was not conducive to trade.

The Kyrgyz Republic promulgated the Law on the Fundamentals of Technical Regulation in the Kyrgyz Republic in 2004, which initiated the country's transition from a regulatory system based on mandatory standards to a modern QI system.¹ Kyrgyzstandart was reengineered a couple of times, ultimately losing its regulatory powers, which were transferred to the Ministry of Economic Development, Industry and Trade, and renamed the National Institution for Standards and Metrology (NISM).

Thereafter, several development agencies got involved in building the capacity of the country's QI, mainly the U.S. Agency for International Development (USAID), the International Trade Centre (ITC), the National Metrology Institute of Germany (PTB), and the World Bank. The ITC initiated the establishment of an independent accreditation body, PTB provided support for the metrology system, and the World Bank project was involved in capacity building in the NISM and other entities in certain areas. An important element of the World Bank project was the initiation of a modern technical regulation system to replace the mandatory standards regime.

The Kyrgyz Centre for Accreditation (KCA) was established in 2007. ITC, PTB, and World Bank experts trained auditors and supported the development of the KCA's management system documentation. The KCA became a signatory to the International Laboratory Accreditation Cooperation (ILAC) Mutual Recognition Arrangement (MRA) in 2013. USAID and the World Bank provided the NISM with modern measurement equipment, and PTB provided technical support for the NISM laboratories, which enabled them to eventually be accredited as a precursor for their calibration and measurement capabilities (CMCs) to be recognized in the International Bureau of Weights and Measures (BIPM) Key Comparison Database. Several testing laboratories were supported in their quest for accreditation to ISO/IEC 17025 ("General Requirements for the Competence of Testing and Calibration Laboratories"), and multiple enterprises were supported to gain ISO 9001 ("Quality Management Systems—Requirements") certification.²

The World Bank provided technical support for the development of modern technical regulations based on international standards. By the end of the project, 35 new technical regulations had been developed and implemented, and the number of mandatory standards had been reduced from 5,500 to fewer than 650.³ The system to transfer all mandatory standards to more modern technical regulations was in place. Ministries were supported in establishing the regulatory agencies responsible for market surveillance, and their inspectors were trained. An effort was made to liberalize the conformity assessment regime so that technically competent service providers such as the NISM and others could play a meaningful role.

The reengineering of Kyrgyzstandart was not always easy: the changes cost it a large proportion of its income, which senior management saw as a loss of prestige and power. Hence, it was not too keen on implementing the changes. However, good cooperation between the development partners, as well as a concerted effort to advise the policy and decision makers over the years, helped to successfully deal with this challenge.

The case study covers the period from 2003 to 2013 (table 1), during which the major changes to the QI and technical regulation were implemented in a top-down fashion. After these far-reaching changes, many challenges did remain. First, the private sector's low uptake of QI services remained a worry

TABLE 1 Snapshot of quality infrastructure (QI) reform in the Kyrgyz Republic

BEFORE REFORM	AFTER REFORM
The national standards body, Kyrgyzstandart, was responsible for standards, inspection, testing, certification, metrology, and accreditation; in other words, numerous conflicts of interest existed.	Kyrgyzstandart was responsible for standards, metrology, and conformity assessment. The Kyrgyz Centre for Accreditation (KCA) was established. The conflicts of interest were set aside.
All 23,000 standards were considered mandatory.	The mandatory standards system was abolished, and a system of modern technical regulation was established.
Kyrgyzstandart was responsible for the implementation of mandatory standards.	Implementation of technical regulations was separated from Kyrgyzstandart and moved to the relevant ministries. Regulatory authorities in the ministries were trained in modern market surveillance practices.
Kyrgyzstandart had a monopoly on the testing of products in the Kyrgyz Republic falling within the scope of the mandatory standards.	Testing was liberalized, with the technical competency of conformity service providers being established through accreditation.
The equipment of the metrology laboratories of Kyrgyzstandart had deteriorated to the point of not being capable of getting international recognition.	The equipment of the metrology laboratory in the National Institution for Standards and Metrology (NISM) was modernized, and systems to gain international recognition were introduced. Laboratory intercomparisons have been started.
The accreditation activities of Kyrgyzstandart did not meet international standards, and no international recognition by the International Laboratory Accreditation Cooperation (ILAC) or the International Accreditation Forum (IAF) was possible.	The independent KCA was established and supported to achieve international recognition by ILAC.

because it negatively influenced the financial sustainability of the QI organizations. The cause was not quite clear, but the only slight involvement of the private sector in the design of the projects, as well as not adequately developing the demand side for QI services, may have played a role. Second, agreement could not be reached on a holistic food safety system, and its interfaces with QI services were not defined. As a result, food safety is governed by technical regulations—a system that may not be the best way to ensure food safety from “field to fork,” because it deals only with the integrity of the final product.

COUNTRY CONTEXT

General background

The Kyrgyz Republic lies in Central Asia and is bordered by China, Kazakhstan, Tajikistan, and Uzbekistan. The country is almost completely mountainous—located at the juncture of two great Central Asian mountain ranges, the Tien-Shan and the Pamir, both with elevations in the 7,000 meter range. More than half of the Kyrgyz Republic lies at an elevation higher than 2,500 meters, and only about one-eighth of the country is lower than 1,500 meters. Bishkek, the capital, lies at 900 meters. With the collapse of the Soviet Union in 1990, the Kyrgyz Republic, together with many of the other Central Asian constituent parts of the Soviet Union, was established as an independent state.

Economic situation after 1990

Following the collapse of the Soviet Union, the Kyrgyz Republic's political and economic transition during the 1990s was mired in heavy political and societal crosswinds and severe economic losses. The immediate impact was a cumulative decline in gross domestic product (GDP) of 54 percent from 1991 to 1995 and a sharp increase in inflation. After a short recovery in 1996, the Kyrgyz economy was again severely affected by the Russian financial crisis in 1998; annual GDP growth fell to about 2 percent, inflation reached 36 percent, and the Kyrgyz som depreciated against the dollar by 43 percent. The economy started to show signs of recovery in 2000, with GDP growth rebounding to more than 5 percent in 2001. Inflation decreased below the two-digit level, and the foreign exchange rate stabilized.

In response to the tumultuous economic climate of the 1990s, the country embarked on policy reforms to improve governance, enhance economic liberalization, and promote privatization and financial sector development. These efforts resulted in the Kyrgyz Republic's accession to the World Trade Organization (WTO) in 1998 and its establishment as one of the more proactive economic reformers in the region.

Nevertheless, the Kyrgyz Republic continued to face significant challenges. The country lacks natural resources, with the exception of gold and water, and is geographically landlocked. The economy was mostly based on agricultural production, hydropower generation, and declining gold production.

In addition, the business environment remained inadequate and was not conducive to foreign investment and private sector growth. As a result, private sector investment was muted, and foreign direct investment in the non-gold sectors was negligible. Perhaps more important, the Kyrgyz Republic's trading gap with other Commonwealth of Independent States (CIS) countries widened as the country failed to capitalize on price stability and growing demand from its key traditional regional trading partners, Kazakhstan and the Russian Federation.⁴

Private sector growth was also dampened by political turmoil. The first elected president of the republic was forcibly removed from office in 2005. Political and social tensions were in turn aggravated by a lackluster economy with limited opportunities for private sector investment.

Kyrgyz policy makers faced numerous challenges on policies to accelerate private sector investment and export diversification. The policy reform agenda included the following elements:

- Lowering administrative barriers to businesses (notably in the areas of taxation and inspections)
- Enhancing enforcement of property and creditors' rights
- Improving the lending infrastructure and legal framework
- Modernizing and streamlining the customs regime and cross-border environment
- Targeting investment in infrastructure, notably to support trade
- Streamlining and aligning the domestic standards and certification regime on international standards.

The latter element initiated a major program to reform the erstwhile Soviet-style approach to standardization and technical regulation—a program designed to align the Kyrgyz systems with international good practices.

BACKGROUND OF QI ISSUES

The national quality infrastructure

The QI of the Kyrgyz Republic was modeled on that of the Soviet Union. Because of a lack of market forces in the state-planned economy, the quality of the products manufactured by industry were controlled by GOST standards, which were mandatory.⁵ The basic premise of the Soviet system was that a designated state organization was given the responsibility to control its sector through a complete set of measures that included the publication of mandatory standards,⁶ inspection of enterprises and the market, testing and certification of the relevant products, and authorization (a form of accreditation) of any laboratories operating in the sector. By the 1990s, approximately 23,000 GOST standards were developed and enforced by the Soviet agency Gosstandart.⁷

Establishment and formation of the QI in the Kyrgyz Republic fell into the years of 1969–71, and this function was realized by the former National Laboratory of State Surveillance of Soviet Gosstandart in Bishkek. After independence, the agency in the Kyrgyz Republic was transformed into Kyrgyzstandart, but it continued with all its former activities.⁸ This gave it a powerful and controlling presence in Kyrgyz industry in several ways:

- *Standards development* was the responsibility of several technical committees allocated to various organizations outside of Kyrgyzstandart. Although Kyrgyzstandart did not actively participate in many of these, it registered the standards developed by them as national standards. The main focus was still the development of mandatory standards.
- *International or regional standards* had to be registered with Kyrgyzstandart before they could be used by industry. The same applied to industry standards developed in-house by companies.
- *Testing for compliance with the mandatory standards*—for those that fell into Kyrgyzstandart’s sphere of responsibility—gave the agency a virtual monopoly in that sphere, and it had a fairly well organized metrology department.
- *Authorization (later called accreditation)* of state-regulated activities in the Kyrgyz Republic was provided by at least four organizations, one of which was Kyrgyzstandart.

This system had some negative consequences. First, to ensure compliance with the vast number of mandatory standards, Kyrgyzstandart employed a large technical staff that visited every economic actor regularly to take samples for laboratory testing to ensure that the products met these mandatory standards. The primary result of this system was that, as a regulator, Kyrgyzstandart was disliked in industry because its inspectors could stop the production and marketing of products at any time it believed that standards were not met.

Second, some of the GOST standards were based on international standards, but by the mid-2000s, many of them were technically outdated. Initially the Soviet Union was active in the International Organization for Standardization (ISO), and it was responsible for the translation of all ISO standards into Russian (one of the ISO’s three official languages, the others being English and French). However, with the demise of the Soviet Union, translation of ISO standards into Russian lapsed—so much so that, today, few of the current ISO standards are still available in Russian from the ISO, making it difficult for the Kyrgyz Republic to adopt them owing to language issues.

Third, from 1990 onward, much of the technical infrastructure of Kyrgyzstandart deteriorated because of a lack of funds and the loss of important technical support from Gosstandart in Russia.

To alleviate some of the negative effects, the government split Kyrgyzstandart in two in July 2001, namely into (a) the State Inspectorate for Standards and Metrology, and (b) the Kyrgyz Centre for Testing and Certification, which was established as a state enterprise. In February 2004, the State Inspectorate for Standards and Metrology was reorganized into the NISM (whose formation is discussed below), and state surveillance was transferred to the Ministry of Economic Development, Industry and Trade. Accreditation was to be separated, but it remained with the NISM until 2007. The Kyrgyz Centre for Testing and Certification was reincorporated into the NISM by June 2005.

Law on the Fundamentals of Technical Regulation

In April 2004, in line with the Kyrgyz government's deregulation efforts, the parliament adopted the Law on the Fundamentals of Technical Regulation in the Kyrgyz Republic, which initiated the country's transition from a burdensome regulatory system based on mandatory standards (the Soviet GOST system) to a leaner system based on international standards. The law was introduced with the anticipation that it would help alleviate the regulatory burden imposed on businesses; enhance enterprise competitiveness by lowering transaction costs (such as the cost of regulatory compliance and rent extraction); and boost exports by removing technical barriers to trade. This legislation was developed with support from USAID (in conjunction with Pragma, a USAID contractor), incorporating the best of international practices of the time.

Yet the implementation of the Law on the Fundamentals of Technical Regulation in the Kyrgyz Republic was undermined by, among other things, legal inconsistencies between primary and secondary legislation, resulting in an excessively bureaucratic system exacerbated by overlapping functions of various agencies involved in conformity assessment, state surveillance, and control. The situation was further aggravated by the understandable reluctance of Kyrgyzstandart to relinquish direct control over the vast number of economic operators (because the system of mandatory standards was to be phased out)—a reluctance that soon morphed into active resistance.

In spite of its reluctance, Kyrgyzstandart was forced to undergo a complex restructuring to change it into a nonregulatory, nonenforcement service provider as a first consequence of the implementation of the law. Kyrgyzstandart was supported in this restructuring exercise through an USAID/Pragma project. It was henceforth known as the National Institution for Standards and Metrology (NISM).⁹ The NISM introduced a number of changes to survive the inevitable drop in regulatory income, with mixed results.

Standards

During the reengineering of the NISM in 2005–06, especially because the administration of mandatory standards was going to be separated from the NISM, the organization sought to limit expenditures because the administration of mandatory standards delivered the bulk of the budget, soon to be diminished. One of the main cost centers was standards development. Under the pretext of decentralization, the NISM transferred the responsibility for standards

development to a large number of organizations, academic and otherwise. In reality it was a major cost-cutting measure. Although great in theory, standards development was not the major responsibility of any of these organizations; nor did they have the relevant budget. Hence, standards development came to a standstill fairly quickly. This had a further negative impact on the availability of a suite of modern, internationally aligned national standards.

Metrology

During the Soviet era, the traceability of the national measurement standards of the Kyrgyz Republic to the International System of Units (SI) was ensured through the traceability chain maintained by the central metrology laboratory of Gosstandart in Moscow. The metrological traceability scheme under Gosstandart was a unique Soviet mandatory verification scheme, not comparable to the international definition of metrological traceability through calibrations, as requested in all international standards. With the demise of the Soviet Union, this traceability chain collapsed, leaving the metrology systems of the relevant states (Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan) without the top link to the SI system of international metrology definitions.

Furthermore, based on laboratory assessments under both the World Bank and PTB projects, it was found that the NISM laboratories were poorly illuminated; equipped with inappropriate furniture; and lacked basic laboratory infrastructure such as a regulated electricity supply, an exhaust system, and so on. The laboratories were also used as storerooms for all sorts of materials and outdated equipment, and ornamental potted plants were standing around. In such an environment, it would be impossible to function as a proper metrology laboratory providing reliable measurements and calibration.

Accreditation

Following the Soviet Union–style arrangements described earlier, the Kyrgyz Republic still had at least four accreditation bodies operational by 2004 when the Law On the Fundamentals of Technical Regulation in the Kyrgyz Republic was promulgated. During the government’s initial restructuring of Kyrgyzstandart in 2001 as the NISM, the NISM was to be responsible for standards, metrology, and accreditation. Its testing and certification business was separated and established as a state enterprise, the Kyrgyz Centre for Testing and Certification. Such a construct is nominally acceptable in the international QI community to avoid conflicts of interest, but it is not very common.¹⁰ Hence some doubts remained, fueled by the fact that all staff were still sitting next to each other in the same building as before.

Overall situation

Unfortunately, the initial restructuring of Kyrgyzstandart and the transfer of the implementation of mandatory standards to the Ministry of Economic Development, Industry and Trade failed to deal properly with the replacement of mandatory standards administration; hence the whole mandatory standards system came to a grinding halt. The result was that the safety and health of society, the health of the environment, and consumer protection were compromised.

The absence of an internationally recognized metrology and QI was hindering economic development, because it raised the country’s vulnerability to non-tariff barriers to trade, which in turn delayed market access and further

industrial and economic development. As a result, the harmonization of domestic standards with international standards, the establishment of a reliable metrology and conformity assessment infrastructure, and a technical regulation regime in line with international good practices became high priorities on the agenda of policy makers.

PROJECT OBJECTIVES AND COMPONENTS

A number of development agencies got involved in supporting the Kyrgyz Republic in modernizing its QI and technical regulation regime. These included USAID and the ITC in the early stages. Later, the World Bank, PTB, and other agencies also got involved, as the following subsections discuss.

USAID/Pragma project

The USAID/Pragma project provided the impetus for the development of a modern QI and technical regulation regime in the Kyrgyz Republic. This program, designed to facilitate accreditation across the region, led to the development of the Law on the Fundamentals of Technical Regulation in the Kyrgyz Republic, the initial restructuring of Kyrgyzstandart, and the provision of high-level metrology equipment for the NISM metrology laboratories.

ITC/SECO project

The Trade Promotion in the Kyrgyz Republic program was funded by Switzerland's State Secretariat for Economic Affairs (SECO) and implemented by the ITC (2008). It was designed to strengthen the sustainable expansion and diversification of fruit and vegetable exports. It aimed to build national capacity for trade development by focusing on business service providers while also addressing institutional issues.

This project's interventions were demand driven, built around the three pillars formulated as immediate objectives:

- *Improve the export competitiveness* of enterprises in the agroprocessing sector
- *Strengthen the business support organizations* by increasing the quality and range of their services
- *Support the finalization and implementation of the sectoral export strategy* and integrate it in a framework of sustained public-private consultations on trade development.

During the ITC/SECO project, various reviews of the Kyrgyz QI were conducted in 2001 to 2006 under the second pillar of the project. These led to the development of technical support in the field of accreditation for both the establishment of a national accreditation organization and the accreditation of several laboratories. International experts developed a blueprint for the accreditation body's organizational structure, and the ITC provided some training for the initial group of auditors. The ITC also supported laboratories to implement proper management systems complying with ISO/IEC 17025 (ITC 2008).

World Bank project

The World Bank project, Reducing Technical Barriers for Entrepreneurship and Trade (RTBET), was conceived in principle in July 2004. The project proposals took a fair time to mature, and it was approved two years later in July 2006. Implementation started in January 2007 and lasted until March 2013, although it had been planned to end in April 2011. The extension had two main reasons: (a) the political turmoil in the country in 2010 that impeded progress, and (b) the slow delivery of sophisticated metrology equipment (largely due to a lack of the technical expertise to use it) right at the end of the project (IEG 2014).

Objectives and ultimate impact

The RTBET project was designed to provide assistance to streamline the technical regulation framework and develop and strengthen the QI (IEG 2014). In the design of the project, the World Bank benefited from prior projects, in particular those of the ITC and USAID (discussed earlier) that had undertaken a series of initiatives to provide assistance in similar areas—culminating, among other achievements, in the 2004 passage of the Law on the Fundamentals of Technical Regulation in the Kyrgyz Republic, as described in the earlier subsection on the law.

The project design emphasized building capacity and effecting culture change through the introduction of best practices. These were gaps the World Bank had identified to help the transition to an effective modern standardization and technical regulation regime, a transition that had been initiated to some extent by previous development agencies' activities. Hence, the initial project objectives were defined broadly as

- Streamlining the national technical regulation and standards framework for business;
- Developing systems to enhance the quality and safety of products; and
- Increasing enterprise competitiveness in pilot sectors.

These objectives remained relevant until the end of the project. The project impact, or key outcome indicator, was to be a decrease in the cost of regulatory compliance for business. It was also stated that although it may not have been measurable during the life of the project, the project was also expected to result in a longer-term increase in the share of non-gold trade with WTO member states. However, this was not interpreted as part of the project objectives because it was highly unlikely that this result would become visible during the life of the project.

Key results

The key project outcome indicator—a decrease in the cost of regulatory compliance for business—was supported by a number of key result indicators for the project activities:

- Development and adoption of technical regulations in key regulated sectors
- Removal of unnecessary mandatory certification requirements
- Reduction in the list of products subject to mandatory certification
- Increase in the percentage of national standards harmonized with international standards
- Increase in the number of measurement and calibration services with lower associated uncertainties

- Establishment of a national accreditation body compliant with ISO/IEC 17011 (“Conformity Assessment—Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies”)¹¹
- Accreditation of at least two testing laboratories and two certification bodies according to international standards
- Certification of at least 10 companies under ISO 9001 and ISO 22000 (food safety management) or hazard analysis and critical control points (HACCP).¹²

This was a formidable list, considering the funding resources of approximately US\$5 million that the World Bank and the Kyrgyz Republic were prepared to invest in the project. Not only was it a long list, but the wide range of activities and expertise required for a satisfactory outcome would also prove to be challenging. Building capacity in QI institutions is a question of appropriate accommodation, management system implementation, technology enhancement, and staff training—activities that can be managed. Effecting a *culture change*—that is, becoming a service delivery organization rather than being a regulatory agency (for example, the NISM)—would prove to be much more difficult. The same applied to other regulatory agencies that had to change from Soviet-style controllers to becoming the conscience of society regarding safety, health, and consumer protection.

Project components

To achieve its objectives, the RTBET project was designed with three major output components and a local project management structure.

Component 1: Technical regulations. This component would facilitate the transition to the new standardization and technical regulation framework by building capacity in the Ministry of Industry, Trade and Tourism (MITT) and other agencies involved in the development of technical regulation. Under this component, the project would support:

- Development of a work plan for implementation of the Law on the Fundamentals of Technical Regulation, which had been approved in 2004;
- Development of technical regulations in critical sectors with high contribution to GDP and export/import substitution potential such as agribusiness and food processing;
- Design and establishment of an integrated information system linking MITT, the NISM, and the various line ministries and regulatory agencies responsible for the development of sector-specific technical regulations; and
- Capacity development in the WTO Inquiry Point¹³ for processing inquiries and notification of adopted technical regulations and related regulatory documents to the WTO and its members.

Component 2: Metrology and standards. This component was designed to:

- Provide critical national measurement standards, instrumentation, and measuring equipment for the metrology institute to satisfy basic measurement needs required by industry and to ensure the accuracy and traceability of measurements performed by the domestic laboratory infrastructure and industry; and
- Establish procedures for the development and publication of national standards (including adoption of international standards) by the national standards body, in accordance with the WTO Agreement on Technical Barriers to Trade (TBT Agreement) requirements and ISO/IEC Directives.

Component 3: Accreditation and quality enhancement. Assistance in this component would focus on three areas—accreditation, testing laboratories, and certification bodies—and quality at the enterprise level, as follows:

- *Accreditation body.* As part of its technical regulation and standardization reform, the Kyrgyz government was planning to spin off the accreditation function from the NISM and set up an independent, internationally recognized accreditation body. For the new accreditation body to gain international recognition, its structure and processes would have to be in compliance with the requirements of the applicable standard for accreditation bodies, namely ISO/IEC 17011. Hence, institutional development assistance was to be provided on its institutional design, governance arrangements, process design, and staff skills and expertise.
- *Testing laboratories and certification bodies.* This subcomponent would provide support on a pilot basis for the upgrading and accreditation of selected laboratories operating in the agribusiness and food processing sectors as well as selected certification bodies in quality management systems and products. The laboratory and certification bodies involved in this demonstration pilot would be selected based on the assessment to be carried out by a technical consultant.
- *Quality at the enterprise level.* This subcomponent would provide assistance on a pilot basis to enterprises willing to introduce quality in their production lines and management systems (that is, certification to standards of the ISO, HACCP, and others). Procedures, guidelines, and eligibility criteria for selecting beneficiaries would be agreed to between the World Bank and MITT.

Component 4: Project management. For a complex project such as this, project management would be a key success factor. A project implementation unit (PIU) would therefore be established in Bishkek. The staff would include a project manager with basic knowledge of technical regulation and QI-related issues, a procurement specialist, and a disbursement specialist. The project would also set up a steering committee consisting of representatives of relevant ministries and agencies as well as private sector representatives. The steering committee would provide policy guidance and ensure that project activities were implemented in accordance with the project objectives.

National Metrology Institute of Germany (PTB)

The PTB project was a regional project for the Central Asian countries of Kazakhstan, the Kyrgyz Republic, Tajikistan, and Uzbekistan implemented from 2008 to 2013 with a budget of €1.3 million. The project's overall objective was to support the transition of the planned-economy QI of these countries to one based on the international norms and good practices of a market economy (PTB 2015).

In the initial phase of the project, the legal frameworks of the countries were addressed. In the follow-up phase, the institutions' activities were aligned with international standards and their service delivery was enhanced. The implementation methodology focused on two areas: (a) the capacity development of the metrology and accreditation institutions, and (b) raising the awareness of political decision makers as to the necessity of gaining international recognition for the QI institutions, which would require major reengineering of said institutions.

In collaboration with the World Bank, a bilateral subcomponent with the Kyrgyz Republic was created to support capacity development in metrology. Although the World Bank provided the resources for the equipment, PTB provided consultation on equipment selection, tendering, and laboratory renovation as well as staff training to develop metrological services with international recognition.

PROJECT DESIGN AND IMPLEMENTATION

The project designs of the various development agencies emanate from different perspectives as well as common points of departure, depending on donor policies and strategies. One strategy might focus on getting the recipient country to become better connected to world trade—a sort of altruistic approach. Another might be more interested in ensuring that the trade regime of the recipient country becomes better aligned with its own, thereby creating markets for its own exports. Even though the implementation of various development agencies projects complemented each other some of the time, there were inevitably also overlaps and duplications.

ITC/SECO project

The Kyrgyz Centre for Accreditation (KCA) was actively supported by the ITC as part of the Trade Promotion in the Kyrgyz Republic Program, funded by SECO. Although not designed specifically to support the development of the QI of the Kyrgyz Republic, the ITC/SECO project was instrumental in defining the trajectory for the establishment of the KCA and its ultimate international recognition (ITC 2008).

The ITC/SECO project (2004–08) was designed as a trade promotion project to strengthen the sustainable expansion and diversification of fruit and vegetable exports, including a focus on business service providers, and also to address institutional issues. As a small element of the project, relevant testing laboratories in the Kyrgyz Republic that test and certify products to meet food- and vegetable-related requirements were to receive training and technical support to gain accreditation. At the same time, accreditation was to be supported to gain ILAC signatory status so that the services of the Kyrgyz-accredited laboratories would gain international acceptance.

The Kyrgyz government separated accreditation activities from the NISM in 2007 (after an in-depth 2006 ITC report by international experts on the establishment of an independent accreditation body) and merged the other three accreditation activities with it. The ITC's support included assisting the KCA through two project phases to develop a comprehensive set of manuals and procedure documents to satisfy ILAC requirements. The ITC provided training of auditors and supported the KCA through two peer evaluations carried out by an ILAC evaluation team.

In October 2013, the KCA became a signatory to the ILAC MRA. The KCA was now a full member of ILAC in terms of accreditation of testing laboratories for compliance with ISO/IEC 17025. At the time, the register of the Kyrgyz national accreditation system included 81 laboratories.

A smaller contribution from the ITC/SECO project was support for the NISM to become a member of the International Organization of Legal Metrology (OIML), and it provided the finances for membership until 2007.

World Bank

Project design

As discussed earlier, the RTBET project was designed primarily to streamline the technical regulation framework and develop and strengthen the QI of the Kyrgyz Republic, both being important competitive elements of any industry.¹⁴ The third component of the project included a subcomponent to support enterprise competitiveness, which included the upgrading of selected laboratories operating in the agribusiness and food-processing sectors. Another subcomponent, which focused on quality enhancement, provided financial support for companies to introduce quality into their production processes through certification to relevant ISO standards: ISO 9001 and ISO 22000 or HACCP. The latter was no doubt informed by the World Bank's Agribusiness and Marketing Project for the Kyrgyz Republic (2005–13), whose objective was capacity building in the entire food-processing and marketing value chain.¹⁵

The state of the Kyrgyz Republic's QI was well known through the earlier ITC/SECO and USAID/Pragma projects, as was the state of its technical regulation regime as a legacy from Soviet days. But an analysis underpinning the enterprise competitiveness objective was limited in scope. The link between outputs and outcomes in the case of this project was also dependent on the expected response by Kyrgyz entrepreneurs and foreign buyers: To what extent would exporters invest in quality improvements in their production process? And what would have been the acceptance by foreign buyers of Kyrgyz product standards? The answers to these questions might have helped set more realistic expectations for outcomes related to the use of the enhanced QI services and the impact of lower regulatory compliance costs.

Project implementation: Standards

The NISM's decision to hand over standards development to other organizations was reversed. The NISM's standards development activities were instead strengthened, ultimately enabling the NISM to adopt many ISO standards as national standards.

The NISM, renamed the Centre for Standardization and Metrology (CSM) during the project, remained the principal government body involved in developing and adopting standards. The CSM established 20–30 technical standardization committees—consisting of representatives of business, research and development organizations, consumer rights protection organizations, and others—to be involved in developing national standards. The technical standardization committees develop, revise, or amend about 60 national standards each year. Under the framework of the existing system, national standards are harmonized with international standards such as the ISO, the International Electrotechnical Commission (IEC), and the Codex Alimentarius.

At the beginning of 2012, approximately 22,500 standards were registered with the NISM/CSM. Out of this total, 90.7 percent were GOST Inter-State standards; 5.7 percent were national standards of other states (GOST-R, STB, and so on); 2.6 percent were national standards of the Kyrgyz Republic; and 1.3 percent were international standards. In general, 46 percent of the national standards were harmonized with the international and European standards. The major share of standards used in the territory of the Kyrgyz Republic are therefore Inter-State standards, which are continuously updated and slowly harmonized with international standards at the level of the Inter-State Council for Standardization and Metrology of CIS countries (WTO 2013).

Project implementation: Accreditation

Although already considered during the ITC/SECO project, it was during the World Bank project that the KCA was actually established in 2007. The long process of gaining international recognition was supported by a “twinning agreement” with the Turkish Accreditation Agency (TÜRKAK) because going it alone is much more difficult. By the end of the project, qualified international auditors carried out an assessment of the international accreditation readiness level of selected testing laboratories and certification bodies. Among the laboratories, the readiness was 90–95 percent depending on the type of testing equipment and procedures. Among the certification bodies, the readiness level was assessed at 75 percent. The ITC/SECO project subsequently helped the KCA to become a signatory to the ILAC MRA (as noted earlier) in October 2013.

Project implementation: Technical regulation

The reengineering of the technical regulation regime is probably one of the main success stories of the World Bank project. The project provided extensive training at the beginning for personnel of the regulatory agencies in the relevant ministries. The project provided technical support to authorities to develop the first of the new-style technical regulations, and it provided support for developing the approval process thereof.

It exceeded its expected performance by a wide margin, even though the enforcement and surveillance of the new regulations were still in the early stages of implementation (IEG 2014). Key achievements included the following:

- The project aimed to have 8 new technical regulations issued, but it ended up issuing 35. These 35 new technical regulations were in force in various sectors, ranging from food and agricultural products to construction and transportation services.
- The list of products subject to mandatory certification was reduced significantly—from 5,500 at project design to 684 at project completion. This significantly decreased the number of mandatory standards for safety and quality requirements from 23,000 Soviet-style GOST standards to just 100 WTO-compliant modern standards.
- The issuance of the new technical regulations led to the simplification of procedures for product certification, lowering the number of days required for certification from 15 to 7.
- By introducing product classification on the basis of their inherent risks, these new technical regulations are at the root of the risk-based inspections

regime that is now being implemented in the country.¹⁶ The introduction of this reform led to a threefold decrease in the number of business inspections—from 20,629 in 2011 to 7,247 in 2012.

The technical regulation reforms continued after project completion. As of July 2013, for example, 43 national technical regulations had been adopted.

Project implementation: Metrology

The various projects provided extensive technical support to establish a proper metrology laboratory in the NISM/CSM. An in-depth evaluation by an international metrology expert in 2007 provided information in three areas:

- Input into the design of a new metrology laboratory
- An evaluation of the Kyrgyz Republic’s needs regarding national metrology standards and other instruments
- Extensive training for metrologists to ensure the proper functioning of a national metrology institute.

The metrology component benefited from useful cooperation between the World Bank and PTB to maximize ongoing professional coaching, training, and peer exchanges. PTB provided critical support to the CSM in the definition of technical specifications for the procurement of laboratory facilities—for example, specification of the measurement equipment on temperature and mass, the specification on construction works, and the control system of the laboratory environment.

Resources accounting for about 40 percent of grant funding from the World Bank project were used to purchase metrology and calibration equipment for the laboratories and to upgrade the physical location to house the measurement standards. Installation of metrology equipment for seven laboratories was provided in the following areas: length, volume, pH-meter, density, pressure, time and frequency, and viscosity. These national measurement standards are used for the calibration of measuring equipment in industry and authorities, linking them to the international system and thereby enhancing the country’s export potential.

National Metrology Institute of Germany (PTB)

The metrology side of the project focused on the training of metrology personnel; support in implementing the appropriate laboratory management systems for compliance with ISO/IEC 17025; and technical support on providing recognized calibration services for mass, pressure, and temperature. The project also supported the NISM’s participation in interlaboratory comparisons under the umbrella of the regional metrology organization, the Euro-Asian Cooperation of National Metrological Institutions (COOMET). The objective of getting at least a few metrology laboratories accredited by the German Accreditation Body (DAkkS) could not be realized within the time frame of the project.

The accreditation side of the project, in partnership with the World Bank and the ITC, provided training of assessors and consultancy on the KCA’s management system documentation for compliance with ISO/IEC 17011. The KCA did manage to gain international recognition by ILAC in 2013, but some challenges remained regarding its procedures with respect to the calibration requirements of accredited entities.

STAKEHOLDERS AND THEIR ROLES

Other than the direct beneficiaries, the main stakeholders benefiting from the advances in the QI activities and the technical regulation regime did not have a direct role in the project design or in its outcomes. The lower regulatory costs were to their benefit, but that was part of the project design from the beginning. The most effective support for the implementation of the projects came from the Authorized Body for Technical Regulation (ABTR) within MITT.

Enterprises were still reluctant to introduce quality management systems to further their marketability in export sectors, especially in the CIS countries that were slowly integrating into the global trade arena. The local market to a large extent still did not require such sophistication. That may come later. Some of the projects, such as the ITC project, also provided support for enterprises to establish quality management systems and then obtain certification. The PTB project organized joint activities with a German Agency for International Cooperation (GIZ) project that targeted enterprise development; for example, combined workshops were held to raise industry awareness about the importance of metrology.

RESULTS ACHIEVED

The results of the various projects to modernize the QI, change the Soviet-style mandatory standards system to a more modern technical regulation regime, and start the process of enhancing the quality practices of enterprises are commendable. The major achievements at the meso level can be summarized as follows:

- The QI fundamentals—standards, metrology, and accreditation—have been organizationally separated from technical regulation implementation, in line with international good practices, and conflicts of interest between them have been set aside.
- The conformity assessment services have been liberalized to an extent, and competency is beginning to be determined by accreditation rather than by designated state entities.
- The linkage of the Kyrgyz metrology system to the international SI system is being reestablished after the loss of it under the Russian agency Gosstandart, and technical capabilities have been enhanced with more modern measuring equipment. The CMCs are still to be registered by the Kyrgyz Republic on the BIPM's Key Comparison Database. To this end, the NISM has participated in laboratory intercomparisons under the auspices of COOMET.
- Accreditation has been merged into a single national organization, the KCA. Initial international recognition through ILAC has been successful, though recognition through the International Accreditation Forum (IAF) still needs to be achieved.
- The number of national standards aligned with international standards has increased substantially, although much still needs to be done to update and harmonize the remaining body of 19,000 GOST-based standards.

- The number of products subject to mandatory standards has been substantially reduced, from about 5,500 to fewer than 650 at the time of writing. This is an ongoing activity, and the number may eventually become insignificant as the government approves further technical regulations.
- A few enterprises achieved certification to ISO 9001, HACCP, or similar standards.

It has taken a decade of involvement by development agencies to achieve this, not only by one donor agency but also by the combined efforts of all, indicating the immensity of changing the whole decades-old system through new legislation, new QI and market surveillance organizations, and training—culminating in their international recognition.

PROBLEMS ENCOUNTERED: CHALLENGES AND ISSUES

The reengineering of Kyrgyzstandart

The reengineering of Kyrgyzstandart was a major challenge. It had to be implemented in an environment that was politically reserved and institutionally reluctant, and with personnel who were skeptical about the way forward.

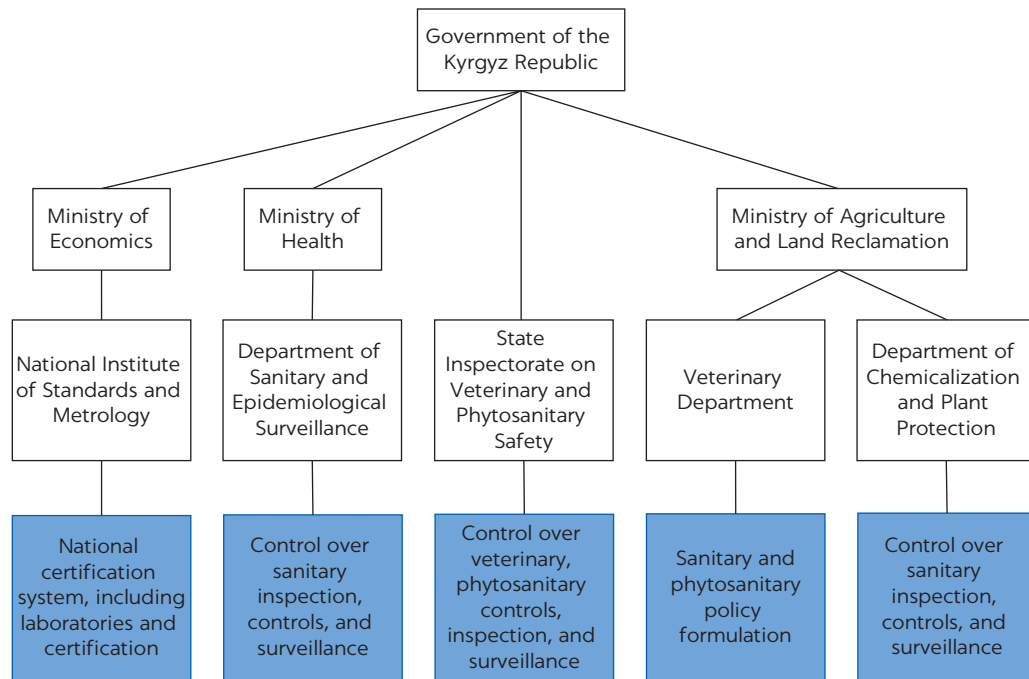
The organization felt seriously aggrieved that it was to lose its control, its “power,” over Kyrgyz industry because mandatory standards administration was being moved to the Ministry of Economic Development, Industry and Trade. No doubt, this perceived loss of prestige was exacerbated by the loss of an appreciable percentage of its income from levies that industries had to pay for the privilege of being “controlled” by Kyrgyzstandart. Hence, the top management of Kyrgyzstandart pursued all avenues to slow down or stop the change. The relationship between the various development agency projects and Kyrgyzstandart’s top management was not always cordial at the beginning.

The development agencies were able to deal with the situation by combining forces. Every plea by the top management of Kyrgyzstandart to revert to the past was countered with well-reasoned formal responses to the authorities, even to the President’s Office, signed by all the development agencies. These responses highlighted the need for the Kyrgyz Republic to establish a QI that was recognized internationally and that reinstating the previous status of Kyrgyzstandart would be a massive step backward with serious negative consequences for the country. Each of the development agencies also used its international experts to discuss these issues from time to time with the relevant authorities. Eventually, after a few years, the stance of the Kyrgyzstandart top management was discredited, and some resigned. Fortunately, the top management stance changed over the course of the projects, but it used up a tremendous amount of emotional energy (to keep calm in the face of continuous adversity), and more of the project resources than expected had to be spent on raising awareness at the political level.

Fragmentation of the sanitary and phytosanitary regime

A related and major issue that could not be properly settled during the projects (and even thereafter) was the food safety environment—that is, sanitary and

FIGURE 1
Authorities involved in implementing sanitary and phytosanitary measures



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phytosanitary (SPS) measures and the relationship between the technical regulation regime and the food safety system. By 2013, the system was still fragmented, with many organizations involved without responsibilities clearly allocated (figure 1).

Policy on SPS measures was marked by frequent changes in direction and structure and the lack of a clear strategy. The work of the ministries and state bodies on SPS matters has been disruptive, with organizational and management changes. In 2012, the government decided to establish a single state inspectorate for veterinary, sanitary, and phytosanitary safety; but in early 2013, it reversed this decision with respect to sanitary inspection. In February 2013, the Ministry of Health took back the functions of sanitary safety. The reason for such changes was that the combined inspectorate did not have the necessary budget, resources, or skilled personnel to carry out its work.

For several years, the legal framework and implementing regulations have been in transition. One of the main issues is that the 2004 Law on the Fundamentals of Technical Regulation in the Kyrgyz Republic formed the framework for SPS matters. Discussions on establishing an overall food law have not come to fruition, and SPS measures are therefore being implemented solely through technical regulations—a suboptimal approach. On the other hand, the Kyrgyz Republic has gradually reduced the number of products subject to mandatory phytosanitary, veterinary, and epidemiological control over the years.

Dependence of conformity assessment on government finances

Notwithstanding the progress in the development of the Kyrgyz Republic's QI under the projects, enterprises' adoption of quality systems or enhancement of product

quality remained slow owing to several factors, ranging from the low sophistication of local companies to competing investment priorities. During the project periods described here, entities rarely achieved ISO 9001 or HACCP certification. But this area is receiving continuous support from later projects that are targeting specific industry sectors with export potential, such as textiles, food and vegetable processing, and so on.

This lack of private sector demand has an impact on the financial sustainability of the QI organizations, especially those that provide conformity assessment services. They have gained recognition at the local and international levels, have been accredited, and use metrology properly, but now their services are not wanted (that is, are not being paid for). Therefore, the conformity assessment service providers find it difficult to continue with accreditation or no longer have their measuring equipment calibrated, with the result that the CSM and KCA income is affected as well. The government therefore has to provide further financial assistance to the QI organizations, even as the country's finances are continuously under pressure.

KEY SUCCESS FACTORS AND LESSONS LEARNED

Cooperation between development agencies

Cooperation between development agencies is intended to coordinate various efforts and avoid unnecessary overlaps of activities. In reality, though, the issue of distribution of credit or recognition for successfully implemented activities is frequently a major point of contention. Instead of working jointly for higher achievements, unnecessary discussions are held about the acknowledgment issues. In the Kyrgyz Republic, useful coordination came about in the capacity development in metrology in the NISM (World Bank and PTB) and accreditation in the KCA (ITC/SECO, PTB, and the World Bank), for example.

First, effective coordination was not achieved by coordinating the different logical frameworks of the development agencies but by the alignment of these frameworks with the needs of beneficiaries and only then leveraging the tasks. Second, coordination is not a task in itself; it should only be a method to achieve better results. Where coordination efforts competed with limited resources for implementation, decisions could be made for the best value for the final beneficiaries, which was not automatically a well-coordinated implementation of the various donor agency activities. Third, coordination benefited from having local office presence.

Project supervision continuity and quality of experts

The continuity of staff in charge of project supervision and the quality of experts are critical factors to the success of projects in a challenging environment. The high risk of the projects, as the Kyrgyz Republic itself was undergoing major changes, made it virtually essential to have a strong field presence. But the real systemic lesson is that it was the lasting continuity in the staff teams—both the field office staff and the team leaders who remained with the projects from the beginning—that made such dedication possible.

The success of the projects was also highly dependent on the professional expertise of the people involved. Local personnel were professionally qualified

and had good relationships with the decision-making circles, and the international personnel were highly qualified in their areas of expertise. This combination contributed significantly to the success of the projects.

Clear linkage between project components, outputs, and outcomes

The linkage between project components, outputs, and outcomes needs to be clearly identified at the project design stage to arrive at more realistic project objectives. The connection between (a) the project *components* of reducing the cost of regulatory compliance and improving the QI (including its international recognition), on the one hand; and (b) the *outcomes* of an increase in product quality on the local markets or enhanced export performance, on the other hand, is not always easily quantifiable for the duration of projects. Hence, these sorts of connections or impacts should be handled prudently during project design. It would be more useful to clearly identify the outputs rather than the laudable but more nebulous long-term outcomes (impacts). This is especially important for smaller projects.

In the World Bank project, for example, the objective of enhancing enterprise competitiveness was supported by relatively small subcomponents: (a) the upgrading of laboratories that provided services to the agribusiness and processed foods sector, and (b) the establishment of a small grant facility for companies that were seeking ISO certification to enhance the quality of their production process. The ITC/SECO project was designed the other way around because it focused on the export competitiveness of enterprises and had only a small component dealing with capacity development in the relevant QI services. Improving enterprise competitiveness is a broad topic that does not always fit with the very specific objectives of streamlining technical regulations and developing the QI to enhance product quality and safety.

However, without a driving force for the implementation of recommendations, they will remain on the level of interesting but practically not applicable information. For example, unless compliance with standards becomes a precondition for exports, the standards will not be seriously implemented and controlled. In other words, even though there is a perception toward stronger demand for products with improved quality standards, unless certain minimum standards are demanded by buyers or by law, implementation by enterprise owners will be slow, despite full conviction of its necessity by the implementation agency.

Twinning arrangements to jump-start the development of newly formed entities

Newly formed QI organizations are seriously challenged to attain a level of competency demanded for international recognition. Although they will learn a lot by going it alone, time is against such a trajectory. The brokered twinning arrangements with internationally recognized peer technical agencies—such as the arrangements between the CSM and PTB and between the KCA with the Turkish Accreditation Agency (TÜRKAK)—not only led to the establishment of excellent cooperation between these institutions but were also instrumental in achieving the required competency in a much shorter time.

Extended project implementation time

Projects with complex technical components should be allowed more time for implementation or should structure their principal components as separate, consecutive projects. Given the high risk factor and technical complexity of the projects to change the standardization and technical regulation regimes of the Kyrgyz Republic, perhaps a longer implementation period could have been considered as well as a larger amount of funding that would have provided the flexibility to finance additional interventions (for example, equipment for laboratories) that may not have been foreseen at the time of preparation.

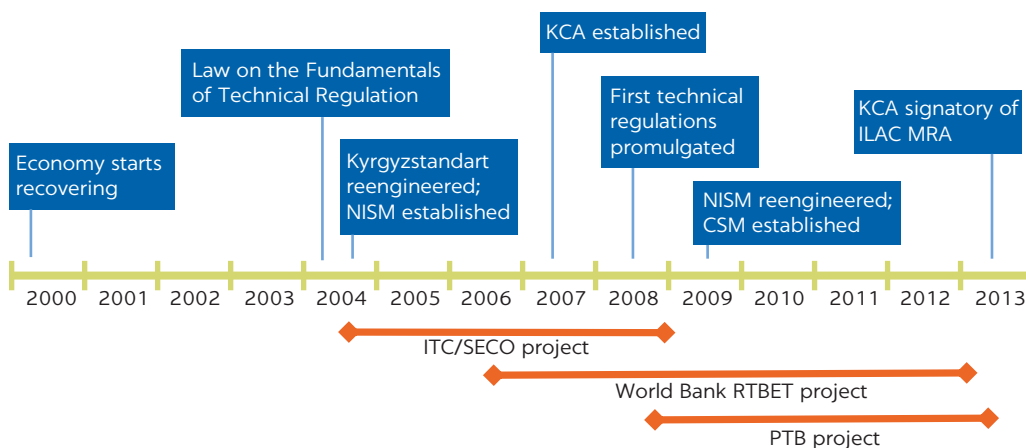
Strategic selection of interventions

Industries or QI organizations that are undergoing transformational changes need to be assisted through the entire spectrum of their operations. If these industries are additionally in a country, such as the Kyrgyz Republic, that is undergoing transitional changes itself, it really does not matter much which field of intervention is selected by the project, because almost any strategic intervention will lead to positive results. It is not so much a question of what to do but how to set priorities to achieve the biggest results with the limited available resources. The first limiting factors (major problems) whose resolution would have the biggest positive effect on the industry or organization should be given first priority.

Success criteria based on the beneficiaries' perspective

The success of project activities also needs to be measured from the perspective of the cooperating stakeholders. Beneficiaries will regard the project as successful only if they appreciate the cooperation and perceive it as a profitable undertaking. The aim should therefore be to produce tangible results from the

FIGURE 2
Timeline of main QI reform project events, Kyrgyz Republic, 2000–2013



Note: CSM = Centre for Standardization and Metrology; ILAC = International Laboratory Accreditation Cooperation; ITC = International Trade Centre; KCA = Kyrgyz Centre for Accreditation; MRA = Mutual Recognition Arrangement; NISM = National Institution for Standards and Metrology; PTB = National Metrology Institute of Germany; RTBET = Reducing Technical Barriers for Entrepreneurship and Trade; SECO = State Secretariat for Economic Affairs (Switzerland).

stakeholders' perspective. Stakeholders must therefore be already active in the planning stage, or the project must have the flexibility to adjust to their real needs at a later stage of implementation.

CONCLUSION

The reengineering of the Kyrgyz Republic's QI and technical regulation regime from 2003 to 2013 (figure 2)—from a Soviet-style mandatory standards system to one more aligned with international market-related good practices—was a difficult and arduous transition. It was mostly driven by the development agencies, starting with USAID and continued by the World Bank, PTB, ITC, and others. It necessitated a top-down approach that saw many profound changes implemented in the public QI and technical regulation domain. On the other hand, the projects, by the development agencies' own admissions, did not take the demands of the private sector fully into account.

One of the major success factors in this massive reengineering exercise was the close cooperation that developed between the development organizations, not only to keep overlaps and gaps in project inputs and outputs to a minimum but also largely to get difficult policy and legislative changes agreed to and implemented by the government and its authorities. It was envisaged that this cooperation would continue between the development agencies once the World Bank RTBET project wound down.

Whether further development aid at levels similar to the 2003–13 period would be forthcoming was unclear at the conclusion of the projects mentioned here. If development agency support were to wind down, the government would have needed to allocate additional resources to ensure the sustainability of its QI and to maintain the human and technical capacity developed in these agencies over the last six years of project implementation. On the other hand, given the budgetary constraints the Kyrgyz government faced, further development of the QI and technical regulation regime may well hinge on the degree of future development agency support and on the agencies' ability to find revenue-generating opportunities.

NOTES

1. Law No. 67, dated May 22, 2004.
2. ISO/IEC 17025:2005 has been superseded by ISO/IEC 17025:2017, "General Requirements for the Competence of Calibration and Testing Laboratories": <https://www.iso.org/standard/66912.html>. ISO 9001:2015, "Quality Management Systems—Requirements": <https://www.iso.org/standard/62085.html>.
3. Although the Soviet-era GOST standards had totaled about 23,000, after the 2004 enactment of the Law on the Fundamentals of Technical Regulation, about 5,500 of those standards were initially retained as necessary to maintain health and safety controls.
4. The CIS, a regional intergovernmental organization of post-Soviet republics, includes the following formal members: Armenia, Azerbaijan, Belarus, Kazakhstan, the Kyrgyz Republic, Moldova, the Russian Federation, Tajikistan, and Uzbekistan.
5. GOST (Russian: ГОСТ) is an acronym for *gosudarstvennyy standart* (Russian: государственный стандарт), which means "state standard."
6. Mandatory standards are standards that have been declared mandatory through legislation, meaning compliance is enforced by law. In this respect, they are technical regulations. In modern economies, standards are considered "voluntary" even though they may be a

- prerequisite for market success or are called for in contracts. Noncompliance may limit market access, but it is not punishable by law. On the other hand, noncompliance with mandatory standards, being technical regulations, is an offense and punishable by law.
7. Gosstandart (Russian: Госстандарт) was the Soviet government agency responsible for standardization, metrology, and quality management as well as the implementation of mandatory standards.
 8. Kyrgyzstandart was responsible for all QI functions as well as the implementation of mandatory standards. These functions included the development and publication of standards, the testing and certification of products to these standards, scientific metrology and weights and measures, accreditation, and market surveillance of all products and services subject to mandatory standards.
 9. The NISM was renamed again in 2009, after a further restructuring, as the Centre for Standardization and Metrology (CSM).
 10. The construct of having standards and accreditation in one organization does not constitute a conflict of interest, whereas having accreditation and conformity assessment together, for example, would be a serious conflict of interest. A few countries have combined standards and accreditation in the same organization; typical examples are Canada and Malaysia. But this is not a common construct; a much more common construct is to combine standards with conformity assessment.
 11. ISO/IEC 17011:2004 has since been revised as ISO/IEC 17011:2017, “Conformity Assessment—Requirements for Accreditation Bodies Accrediting Conformity Assessment Bodies”: <https://www.iso.org/standard/67198.html>.
 12. ISO 9001:1987, originally titled “Quality Systems—Model for Quality Assurance in Design/Development, Production, Installation and Servicing,” has been revised five times. The current standard is ISO 9001:2015, “Quality Management Systems—Requirements”: <https://www.iso.org/standard/62085.html>. ISO 22000:2005, “Food Safety Management Systems—Requirements for any Organization in the Food Chain,” has since been replaced by ISO 22000:2018: <https://www.iso.org/standard/65464.html>.
 13. The WTO Technical Barriers to Trade (TBT) Inquiry Point is an official or office in a member government designated to deal with inquiries from other WTO members and the public on technical barriers to trade.
 14. The discussion in this section is based on World Bank (2013).
 15. See “Agribusiness & Marketing Project,” Project P049724, Projects & Operations, World Bank: <http://projects.worldbank.org/P049724/agribusiness-marketing-project?lang=en>.
 16. In conducting market surveillance, it is difficult to inspect all of the products falling within the scope of a specific technical regulation; it is actually logistically impossible. Hence, regulatory authorities have to make informed decisions regarding audits and sampling. In making these decisions, products with a high risk are obviously going to be inspected more frequently than products of lower risk to health and safety. The same applies to suppliers. Some are notoriously lax in complying with requirements, and others are always in compliance. Based on risk assessment, the choice is then made about which products to inspect and which not to inspect. The history of past inspections plays a big role in arriving at such decisions. In the European Union and the United States, for example, it has been reported that only 3–5 percent of relevant products are inspected on a regular basis.

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