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Independent Evaluation Report

SRI LANKA

Impact of UNIDO SMTQ projects in Sri Lanka

UNIDO projects:

XP/SRL/99/049; TF/SRL/99/003; UB/SRL/00/001; US/SRL/01/108;
TF/SRL/01/001 and US/SRL/04/059



UNITED NATIONS
INDUSTRIAL DEVELOPMENT ORGANIZATION

UNIDO EVALUATION GROUP

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UB/SRL/00/001; US/SRL/01/108; TF/SRL/01/001 and US/SRL/04/059

Conducted under special funding by the
Norwegian Agency for Development Cooperation (NORAD)
in close cooperation with
UNIDO Trade Capacity Building (TCB) branch and
the Institute for Policy Studies (IPS) of Sri Lanka



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Vienna, 2010

Distr. GENERAL

ODG/EVA/R.15

June 2010

Original: English

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The views and opinions of the team do not necessarily reflect the views of the involved Governments and of UNIDO.

This document has not been formally edited.

Contents

Acknowledgements	v
Abbreviations and acronyms	vi
Glossary of evaluation related terms	vii
Executive summary	viii
I. Introduction	1
1.1. Background.....	1
1.2. Evaluation methodology and challenges	2
1.3. UNIDO Counterpart organizations.....	4
1.4. Intervention logic.....	5
II. Project inputs and outputs	7
2.1. UNIDO inputs	7
2.2. Inputs from third parties	8
2.3. Outputs achieved	9
III. Project outcomes at laboratory level	11
3.1. Increased client base and income from testing services	11
3.2. Sustainability of outcomes.....	12
IV. Project outcomes at company level	15
4.1. Use of laboratory testing services by the garment sector	16
4.2. Use of laboratory testing services by the tea sector.....	17
4.3. Use of laboratory testing services by the fishery sector	18
4.4. Use of calibration services.....	18
V. Spillover benefits	21
VI. Impact at company level	25
6.1 Impact on the garment sector.....	26
6.2 Impact on the tea sector	28
6.3 Impact at the fisheries sector	29
6.4 Impact of calibration services.....	30

VII. Impact at society level	33
7.1 Society impact of increased garment exports.....	33
7.2 Society impact of increased tea exports	34
7.3 Society impact of increased fish exports.....	35
7.4 Society impact of calibration services.....	36
VIII. Recommendations and lessons learned	37
Annex 1: Evaluation terms of reference	40
Annex 2: Main project outputs	50
Annex 3: Checklist of “sustainability assumptions”	55
Annex 4: Status of public and private testing laboratories.....	57
Annex 5: International outreach.....	59
Annex 6: Survey of prices for testing services	61

Acknowledgements

This independent evaluation of the impact of UNIDO SMTQ projects in Sri Lanka has been conducted with special funding from the Norwegian Agency for Development Cooperation (NORAD) by the UNIDO Evaluation Group (EVA) in close cooperation with the UNIDO “Trade Capacity Building” (TCB) branch and the Institute for Policy Studies of Sri Lanka (IPS). The present report was prepared by Peter Loewe, Senior Evaluation Officer, UNIDO, on the basis of a comprehensive analysis prepared by two national SMTQ experts:¹ Dr. Nirmala M. Peiris and Ms. Subadra Jayasinghe, and other valuable contributions by Ms. Asha Gunawardana, Institute of Policy Studies of Sri Lanka (IPS), Mr. Deshal de Mel, (IPS), Mr. Colm Halloran, Mr. D. P. Gunawardana, Mr. Anton Fernando, Mr. Ben Bennett and Mr. Selyna Peiris.

The evaluation team acknowledges with appreciation the many and diverse contributions made to this evaluation by the aforementioned experts.

¹ UNIDO (2009); Overview of the National Quality System in Sri Lanka and Evaluation of the Output and Outcome of the UNIDO SMTQ Projects at the SLSI, ITI and TT&SC; by Dr. Nirmala M. Peiris and Ms. Subadra Jayasinghe (Ref: available from the Internet page of the UNIDO Evaluation Group)

Abbreviations and acronyms

ADB	Asian Development Bank
BSTI	Bangladesh Standards and Testing Institution
CDA	Coconut Development Authority
CEA	Central Environmental Authority
CISIR	Ceylon Institute of Scientific and Industrial Research
CSR	Corporate Social Responsibility
DOFAR	Department of Fisheries and Aquatic Resources
GOSL	Government of Sri Lanka
ILAC	International Laboratory Accreditation Cooperation
IPS	Institute for Policy Studies (Sri Lanka)
ITI	Industrial Technology Institute
LACE	Laboratory Approval, Correlation & Evaluation
LKR Mn	Sri Lanka Rupee (Million)
MDG	Millennium Development Goals
NABL	National Accreditation Board for Testing and Calibration Laboratories
NARA	National Aquatic Resources Agency
NMI	National Metrology Institute
NORAD	Norwegian Agency for Development Cooperation
NPC	National Project Coordinator
NQS	National Quality System
SGS	Société Générale de Surveillance
SLAB	Sri Lanka Accreditation Board
LK R	Sri Lanka Rupees
SLSI	Sri Lanka Standards Institute
SLTB	Sri Lanka Tea Board
SMTQ	Standards, Metrology, Testing and Quality
TCB	'Trade and Capacity Building' Branch (UNIDO)
TTSC	Textile Training and Support Centre
UNDP	United Nations Development Programme
UNIDO	United Nations Industrial Development Organization
VRI	Veterinary Research Institute
WB	The World Bank

Glossary of evaluation related terms

Term	Definition
Baseline	The situation, prior to an intervention, against which progress can be assessed.
Effect	Intended or unintended change due directly or indirectly to an intervention.
Effectiveness	The extent to which the development objectives of an intervention were or are expected to be achieved.
Efficiency	A measure of how economically inputs (through activities) are converted into outputs.
Impact	Positive and negative, intended and non-intended, directly and indirectly, long term effects produced by a development intervention.
Indicator	Quantitative or qualitative factors that provide a means to measure the changes caused by an intervention.
Intervention	An external action to assist a national effort to achieve specific development goals.
Lessons learned	Generalizations based on evaluation experiences that abstract from specific to broader circumstances.
Log frame (logical framework approach)	Management tool used to guide the planning, implementation and evaluation of an intervention. System based on MBO (management by objectives) also called RBM (results based management) principles.
Outcomes	The achieved or likely effects of an intervention's outputs.
Outputs	The products in terms of physical and human capacities that result from an intervention.
Relevance	The extent to which the objectives of an intervention are consistent with the requirements of the end-users, government and donor's policies.
Risks	Factors, normally outside the scope of an intervention, which may affect the achievement of an intervention's objectives.
Sustainability	The continuation of benefits from an intervention, after the development assistance has been completed.
Target groups	The specific individuals or organizations for whose benefit an intervention is undertaken.

Executive summary

This impact evaluation was jointly funded by UNIDO and the Norwegian Agency for Development Cooperation (NORAD) and conducted in 2009 by the UNIDO Evaluation Group in close cooperation with the UNIDO “Trade Capacity Building” branch and the Institute for Policy Studies (IPS) of Sri Lanka. The findings and recommendations contributed to a major thematic evaluation of UNIDO activities in the area of Standards, Metrology, Testing and Quality (SMTQ) that was conducted in parallel.

The evaluation covers six SMTQ projects carried out by UNIDO in Sri Lanka between 1999 and 2007. The largest two of these projects were financed by NORAD with a financial support of about 2 million USD. UNIDO mobilized complementary funds from other sources.

The evaluated projects produced significant output. Seven laboratories at three national institutes were upgraded through the delivery of equipment, training and the facilitation of international accreditation. One of the laboratories specializes in the delivery of internationally accredited calibration, a service that did not exist in Sri Lanka before the UNIDO intervention.

The expected outcome at laboratory level has been achieved. The number of clients of the laboratories increased between 27 per cent and 180 per cent and the revenue generated by testing and calibration services between 47 per cent and 264 per cent (2002 to 2008). One of the institutes introduced innovative laboratory management and incentive schemes and other organization wide measures. Due to the joint efforts of UNIDO and the partner institutes, the outcomes at laboratory level are sustainable.

The expected outcome at user level has also been achieved, although with some reservations. Evaluation surveys among companies from three major export sectors (garment, tea and fisheries) indicate that the users of laboratory services are satisfied with the technical quality of these services. However, many of them prefer using private laboratories because of shorter turn around time and better service culture.

The UNIDO interventions produced positive spillovers in at least four different areas. The market for laboratory services has become more competitive with positive effects on prices and quality. One of the institutes was able to tackle unexpected challenges by developing highly relevant new food tests (for unauthorized colors in spices and for melamine in milk powder). Significant knowledge flows occurred from the institutes to other parts of the National Quality System and also to seven countries outside Sri Lanka.

This dimension of increased South-South knowledge flows and cooperation has been one of the most salient achievements of the projects under evaluation.

During the period under consideration, Sri Lanka managed to increase exports from all three sectors analyzed under this evaluation. This improved export performance originates of course from a whole range of causes including the efforts of private and public stakeholders as well as external factors such as: international market trends; Sri Lanka's accession to a preferential trade regime with the EU (GSP+); the tsunami in 2004; the end of the Multi Fiber Agreement and a major industrial promotion programme in the garment sector. Due to this multiplicity of causes the improved export performance cannot be attributed as an impact to the UNIDO intervention alone or to any other single intervention. However, it is plausible to assume that the UNIDO interventions have contributed to Sri Lanka's improved export performance.

The evaluation finds that the improved laboratory testing and calibration services made an important contribution, in particular for fish exports. In the case of garments the outreach was limited mainly because the garments sector is very much driven by private standards and quality systems that are determined by buyers. The availability of accredited calibration services produced wide ranging positive effects not only on the garment sector but also on ship-building and on the economy as a whole.

The evaluation looked also into the possible occurrence of high-level societal impact that could be relevant to the MDGs. Depending on the sector, contrasting findings emerge. A positive "trade poverty nexus" can be postulated for the garment sector which exports sophisticated products to sophisticated markets. In this sector, the work force benefits from labour legislation and consumer awareness for voluntary social standards. The situation is different for tea where poverty among tea growers persists although exports are growing. The work force lacks empowerment and most of Sri Lanka's tea exports are oriented towards emerging markets with limited consumer awareness for social standards. In the fish sector an increasing number of fishermen take advantage from increased exports but the vast majority of fishermen works for local markets and remains rather disconnected from quality improvements. A positive impact on gender balance could be postulated for garment, where workers are primarily female. Some environmental impact emerged from improved waste water control.

The following main lessons learned emerge from this evaluation:

- a) UNIDO has made substantial contributions to sustainable capacity building at seven public testing laboratories. The evaluation report offers a check list of "sustainability assumptions" that should be used in future interventions (ex-ante and during implementation) to optimize the chances of such interventions to become sustainable.

- b) UNIDO capacity building at the public laboratories has led to a more competitive market for testing services with positive effects on the prices and quality of services. Private laboratories (both in-house and service providers) benefited indirectly. Future interventions should explore ways to further enhance the benefits of private laboratories from UNIDO interventions.
- c) SMTQ projects can make significant contributions to poverty reduction provided such impact is dealt with as a priority during the design and implementation of the project. The target groups for expected poverty impact should be clearly defined; sub-sectors with a strong “trade poverty nexus” should be given priority and potential “impact drivers” should be identified, pursued and monitored throughout implementation.
- d) This impact evaluation generated considerable learning effects and has been one of the pillars of the thematic evaluation of UNIDO SMTQ activities. The explanatory power of the “theory based” evaluation approach has been demonstrated for the specific case of SMTQ capacity building projects. The approach should be further pursued and refined under future UNIDO evaluations.

Introduction

1.1. Background

This impact evaluation has been conducted with special funding from the Norwegian Agency for Development Cooperation (NORAD) by the UNIDO Evaluation Group (EVA) in close cooperation with the UNIDO “Trade Capacity Building” (TCB) branch and the Institute for Policy Studies of Sri Lanka.

The impact evaluation covered six UNIDO projects with an overall budget of about 2.75 million USD, which were implemented between 1999 and 2007 (see Table 1).

Table 1: Projects under evaluation

Project Number	Project Title	Budget (USD)	Project End	Donor
XP/SRL/99/049	INTEGRATED INDUSTRIAL DEVELOPMENT SUPPORT PROGRAMME (QUALITY)	127,052	1999	UNIDO
TF/SRL/99/003	STRENGTHENING CAPACITY IN QUALITY, STANDARDIZATION AND TESTING IN SRI LANKA	704,938	2004	Norway
UB/SRL/00/001	SUPPORT TO QUALITY, STANDARDIZATION AND METROLOGY (NORAD COST SHARING)	205,106	2004	Unutilized balance
US/SRL/01/108	SUPPORT IN LABORATORY ACCREDITATION, SRI LANKA	320,709	2005	Republic of Korea
TF/SRL/01/002	TRADE FACILITATION SUPPORT FOR SRI LANKA THROUGH THE DEVELOPMENT OF TESTING LABORATORIES RELATED TO INDUSTRIAL METROLOGY, RUBBER/PLASTIC AND TEXTILE/APPAREL	1,217,779	2007	Norway
US/SRL/04/059	TRADE FACILITATION SUPPORT FOR SRI LANKA THROUGH THE DEVELOPMENT OF TESTING LABORATORIES FOR THE FOOD PROCESSING, CERAMIC AND COIR INDUSTRIES	176,991	2007	UK IP funds
Total USD		2,752,575		

Source: UNIDO Infobase

Over 70 per cent of the financial support for these projects was granted by NORAD who also lent its support to this evaluation. Another NORAD/UNIDO project is currently underway aiming at “Strengthening international certification capacity in Sri Lanka with particular reference to social accountability standard (SA 8000) and food safety (HACCP/ISO22000) standards”. This project is still ongoing and thus not included in this evaluation.

1.2. Evaluation methodology and challenges

By this evaluation UNIDO has made for the first time an attempt to assess the longer term impact of its Technical Assistance (TA) in the area of Standards, Metrology, Testing and Quality (SMTQ). Sri Lanka was selected for this pioneering exercise because of its long-standing cooperation with UNIDO in the subject area.

The impact evaluation was launched on the basis of the initial terms of reference prepared in 2008 that are included in annex 1. On the basis of these Terms of References (TORs) NORAD provided a voluntary financial contribution complementing the UNIDO funding. Field work started in January 2009 with an exploratory phase that included the following five main work packages:

- collection of information on the projects and the achieved outputs (different forms of support provided to SLSI, ITI and TTSC);
- collection of information on the project outcomes (accreditation of laboratories at SLSI, ITI and TTSC and provision of accredited testing services to the private and public sector in Sri Lanka);
- qualitative exploration of the perception and satisfaction of private sector users of these testing services;
- analysis of the National Quality System (NQS) of Sri Lanka and assessment of the position and role of SLSI, ITI and TTSC in the NQS;
- identification of hypothetical “pathways” (or logical chains) by which different sorts of impact (economic; social; environmental) may have occurred.

To conduct these preliminary analytical steps, UNIDO contracted several parties. IPS (a leading national policy research institute) delivered an analysis of the macroeconomic and export performance of Sri Lanka and a report identifying possible “impact pathways”. A national evaluator conducted a series of interviews with a representative sample of industry users of testing services. And an international SMTQ expert analyzed the design of the UNIDO projects; the structure of the NQS, its various players and their respective roles, the contributions of SLSI, ITI and TTSC. He also carried out an in depth analysis of the causal chains by which interventions at the SMTQ level may have produced wider

impact .The exploratory phase ended with a methodological workshop on 13 March 2009 that brought together some 40 participants from all relevant public and private SMTQ providers as well as from industry. At the workshop, the different parties contracted by UNIDO presented their findings.

A multitude of possible impact channels has been identified and screened under the exploratory phase; all of these channels have merits that would justify further scrutiny. Over the last few years, there has been an increased interest in impact evaluation, which is considered highly relevant in terms of further improving the accountability of development cooperation but also challenging in terms of “proving” the wider and more long-term effects of development interventions. Bearing in mind these methodological challenges, the evaluators decided that the exploratory phase of the impact evaluation should be followed by a more in-depth and quantitative research phase.

Based on the findings and conclusions of the exploratory phase, the following five work packages were conducted under the main phase of the evaluation:

- Three commodity specific surveys among Sri Lanka companies (apparel/textile; fish; tea) on the impact of accredited testing laboratory services becoming available, taking into account the specific conditions of each sector;
- One cross-sector study on the impact of the availability of accredited metrology services from ITI;
- An assessment of the improved organizational capacities of SLSI, ITI and TTSC and potential spill-over effects of these improved capacities on the systemic capacities of the Sri Lankan NQS at large;
- A survey among a panel of buyers and importers of goods from Sri Lanka on the relative strengths and weaknesses of the country with regard to quality and its reputation as an exporter of quality goods to the world market (similar to Delphi method);

The evaluation encountered the following methodological and practical challenges:

- Because the impact evaluation has not been planned in advance to the intervention, baseline data are not available, which limits the possibilities to thoroughly compare ex-ante and ex-post situations;
- It has been more difficult than planned to make all critical information available because considerable time has elapsed since the projects under evaluation were designed about 10 years ago, started about 7 to 8 years ago and ended about 4 to 5 years ago. These difficulties with data collection concern both the availability of documents at UNIDO Headquarters as well as statistics on the laboratory services provided by SLSI, ITI and TTSC since 2000. No exact statistical information is available for most of the services provided before 2002. Therefore,

a comparison between services delivered before and after accreditation would not be possible;

- During the period under evaluation, the “competitiveness” of the Sri Lankan economy was heavily influenced by a number of external factors and macro-events, hence the methodological challenges of isolating the hypothetical influence of improved SMTQ services from other much more powerful factors, such as the:
 - i) socio-economic effects of the ups and downs of the civil war and post-conflict situation of the country;
 - ii) destructive effects of the 2004 tsunami on the fisheries sector combined with the extraordinary recovery efforts and donor support that followed this major natural disaster;
 - iii) improved export opportunities to the EU due to Sri Lanka accessing to the privileged status of a GSP+ country;
 - iv) turbulences of the world textile market due to the end of the Multifibre Agreement affecting heavily the textile sector, Sri Lanka’s number one foreign currency earner.
- A number of commodities were identified for which significant impact can be anticipated (garments; fish; tea). However, the related economic sectors vary considerably due to the mechanisms by which SMTQ improvements may have contributed to improved competitiveness and increased exports and the relative importance of such services and the players who provide them as well as the conditions under which these services are provided;
- The collection of company data turned out to be particular difficult and time consuming. Private sector companies in Sri Lanka were not at all keen to spend time on surveys and even less to share sensitive data on their specific position in highly competitive export markets.

1.3. UNIDO Counterpart organizations

The counterpart organizations of the projects under evaluation were the Sri Lanka Standards Institution (SLSI); the Industrial Technology Institute (ITI) and the Textile Training and Support Centre (TTSC). All three institutes are public bodies and come under the purview of different ministries. The SLSI is the national standards body of Sri Lanka. The primary functions of the Institution are formulation and enforcement of national standards, operation of import/export and product certification schemes, operation of systems certification schemes, conducting training programmes on quality management and related fields, providing product testing and calibration services required for standards formulation.

The ITI is the successor to the Ceylon Institute of Scientific and Industrial Research (CISIR), which was established as early as 1955. Today, the ITI is a multidisciplinary scientific research and technical service organization. Its major activities are conducting R&D, providing testing and calibration services to industry and providing consultancy and technical training.

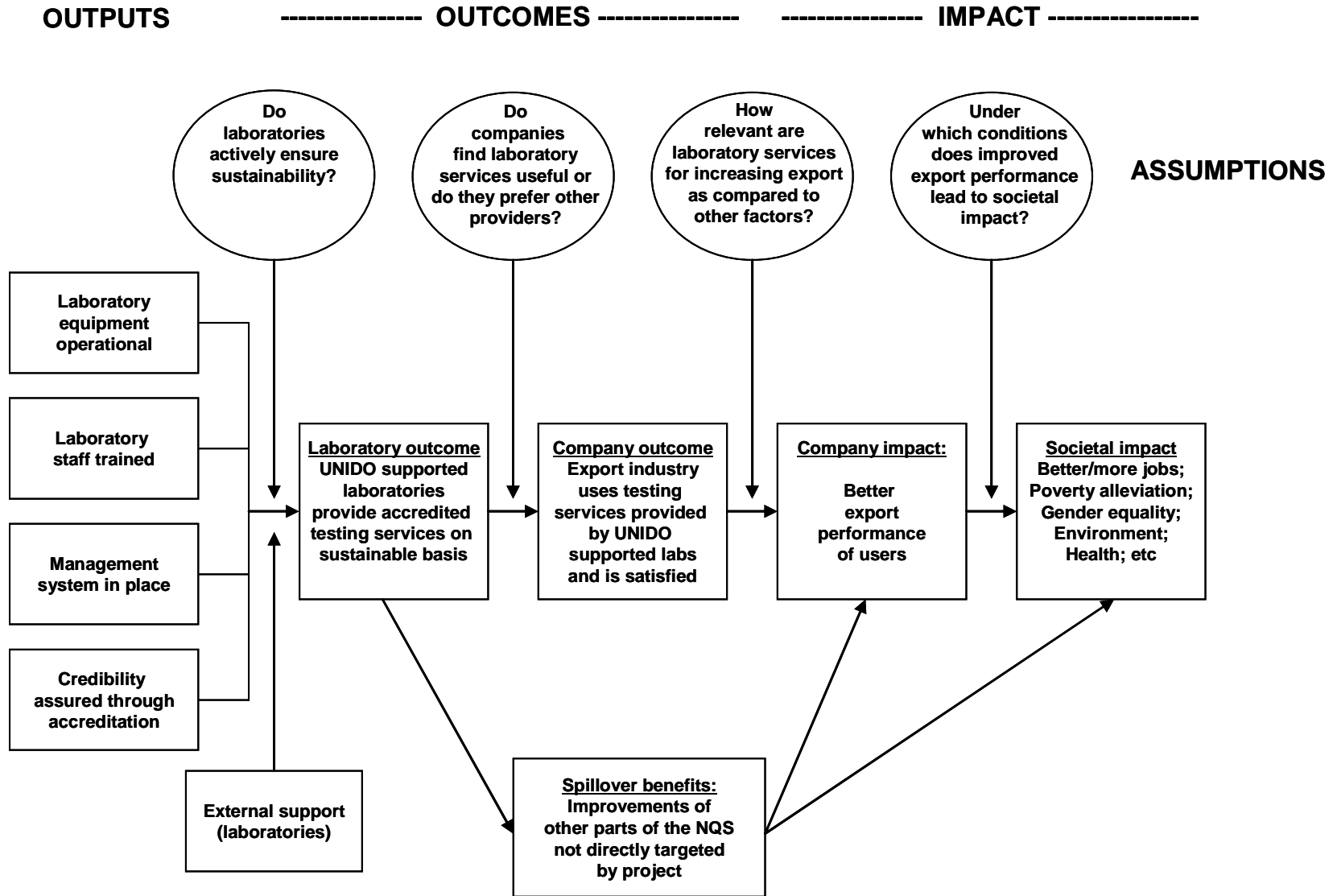
The TTSC was established in 1984 and provides training, consultancy and testing services to the textile and clothing industry with training as the main activity. In June 2009, after a period of uncertainty, the TTSC has been joined with the Clothing Industry Training Institute (CITI) to form the Sri Lanka Institute of Textile & Apparel (SLITA).

1.4. Intervention logic

The six SMTQ projects in Sri Lanka were carried out in a coherent manner but without explicit overarching intervention logic, without a common set of indicators and without baseline information. However, from the analysis of the individual project documents and of programmatic documents concerning UNIDO Trade Capacity Building branch (TCB) activities, implicit underlying intervention logic can be deduced.

For the purpose of this evaluation, the evaluators developed ex-post the assumed overarching intervention logic depicted in Figure 1:

Figure 1: Assumed overarching intervention logic of the projects under evaluation



II

Project inputs and outputs

2.1. UNIDO inputs

The project conducted the following capacity building activities at the three counterpart institutes:

- During the period 1999 to 2004 the SLSI received assistance for upgrading the Chemical and Microbiological laboratories as well as for developing a Management Information System. The approximate value of this intervention was USD 164,000. The SLSI also received assistance for strengthening capacity of its ISO 14000 scheme
- During the period 1999 to 2006 the ITI received assistance for upgrading the Chemical, Microbiological and Food laboratories, the Calibration laboratory and the Rubber laboratory. The approximate value of this intervention was USD 2,200,000.
- During the period 1999 to 2003 the TTSC received assistance for upgrading the Textile testing laboratory. The approximate value of this intervention was USD 20,000.

Table 2 consolidates and quantifies the UNIDO inputs under the headings of consultancy; subcontracts; training and study tours and equipment and shows the amount of investment (input) dedicated to each of these outputs.

Table 2: Consolidated UNIDO inputs

Inputs	SLSI (USD)	ITI (USD)	TTSC (USD)
International consultants	70,000	154,454	-
Sub-contract	50,000	309,364	15,000
Training & Study tours	7,065	186,072	-
Equipment	37,065	1,543,482	5,000
Total	164,130	2,193,372	20,000

Source: Adopted from figures received from National Project Coordinator, UNIDO Focal Point; figures do not include UNIDO support cost, which explains the difference with figures in table 1.

It should be noted that the support among the three institutes was unequally distributed. More than 90 per cent of the total support went to the ITI, while the share of the TTSC was almost insignificant.

2.2. Inputs from third parties

In order to establish the causal link between the UNIDO outputs and the higher levels in the causal chain (Figure 1) and in particular with a view to addressing the so called “attribution problem”, the evaluators looked also into the investments, which the relevant laboratories received from other non-UNIDO sources prior to and during the period under evaluation. As far as still identifiable and quantifiable, these investments are shown in Table 3.

Table 3: Inputs from third parties

Prior to UNIDO interventions								
SLSI			ITI			TTSC		
Source	Period	Amount	Source	Period	Amount	Source	Period	Amount
GOSL	85-01	7.00	GOSL	00-04	0.39	GOSL	96-00	0.32
UNDP	86-91	1.35	ADB	00-04	0.70	Japan	96-00	0.80
Japan	94-99	2.50	WB	94-95	0.22	-	-	-
During the time of UNIDO interventions								
SLSI			ITI			TTSC		
Source	Period	Amount	Source	Period	Amount	Source	Period	Amount
-	-	-	GOSL	01-03	0.08	-	-	-
-	-	-	Japan	03.09	0.35	-	-	-
Total	85-99	10.85	-	94-09	1.74	-	96-00	1.12

Source: Interviews at partner institutes; all amounts are estimated in million USD at an average exchange rate of 1 USD = 100 LKR (Sri Lanka Rupee)

The GOSL investment in the three institutions was mainly for construction and upgrading of the institute building. Both the ITI and TTSC had their own premises, while the SLSI was housed in rented buildings scattered in Colombo. With the GOSL investment the SLSI was able to construct a new building complex housing all activities under one roof. The inputs from other sources such as UNDP, ADB, World Bank and Japan into the three institutes were mostly related to equipment but also to training.

When comparing UNIDO and non-UNIDO investments prior to and during the evaluation period it appears that UNIDO support to the ITI has been highly significant as compared to investment coming from GOSL and other sources, while this is not the case for the two

other institutes. However, zooming into the period of UNIDO interventions the UNIDO support for SLSI is also quite significant because the institute did not receive major support from other sources during this period.

2.3. Outputs achieved

The project outputs consisted primarily of strengthened capacities of seven testing laboratories at the three partner institutes as demonstrated by internationally recognized accreditations. All laboratories reached ISO 17025 accreditation thanks to UNIDO assistance. Table 4 shows which testing parameters were accredited at which laboratory and the year of the initial accreditation. All accreditations were granted by SWEDAC.

Table 4: Accreditations to ISO 17025 achieved with UNIDO assistance

Accredited laboratories and testing parameters	Year
SLSI	
Chemical testing laboratory for specific parameters in fertilizer and water	2002
Microbiological testing laboratory for specific parameters in water, food and beverages	2002
Microbiological testing laboratory (extension of scope)	2006
ITI	
Chemical testing laboratory for specific parameters in water, waste water including heavy metals and pesticide residues	2002
Microbiological testing laboratory for specific parameters in water, waste water, fish and shrimp	2002
Food testing laboratory for specific parameters in fish, seafood and vitamins	2007
Metrology laboratory for temperature and mass calibrations	2004
Metrology laboratory for dimension, volumetric and electrical parameters	2007
Rubber laboratory in rubber and rubber based products	2007
TTSC	
Textile laboratory for 14 parameters in fabric	2002

Of course, these accreditations are only the ultimate result of a much wider range of preliminary and preparatory outputs such as the delivery of equipment; staff training; preparation of manuals and operating procedures; conduct of proficiency tests and design of performance based incentive schemes for laboratory staff. The detailed project outputs are listed in Annex 2.



Project outcomes at laboratory level

3.1. Increased client base and income from testing services

The intervention theory in Figure 1 defines the expected generic outcome at the level of the laboratories as follows:

“UNIDO supported laboratories provide testing services on sustainable basis”

Table 5 shows the number of clients and the revenue generated through testing services by the various laboratories and the increase of these performance figures between 2002 and 2008. These figures demonstrate that substantial positive outcomes occurred at the SLSI and ITI during the evaluation period.

Table 5: Number of laboratory clients and revenue generated

Institute	Laboratory	Number of clients				Revenue (LKR Mn) (values discounted to 2002)			
		2002	2008	Increase		2002	2008	Increase	
				No.	per cent			No.	per cent
SLSI	*Chemical (C)	73	181	108	148	3.6	5.3	1.7	47
	*Microbiological (M)	15	42	27	180	1.1	4.0	2.9	264
ITI	*Chemical & Microbiological (C&M)	366	556	190	52	8.9	21.9	13.0	146
	*Rubber (R)	82	101	19	23	1.0	2.4	1.4	140
	*Calibration (Ca)	174	344	170	98	8.3	18.1	9.8	118
TTSC	**Apparel (A)	87	75	-12	-	17.4	13.2	-4.2	-
	***Textile (T)	18	23	5	27	3.6	15.6	12.0	333

* Direct & Spillover effect

** Apparel – includes other labs

*** Textile – includes Government organizations

The overall situation and the degree of improvement at the three institutes vary.

- Among the three institutes the ITI has been and remains the largest provider of testing services; the number of clients and volume of revenues generated increased substantially since 2002 making it possible for the laboratories to be self sustaining. With respect to actual amounts the chemical and microbiological laboratory and the calibration laboratory of the ITI showed the highest increases by 13.0 and 9.8 LKR Mn respectively.
- Among the three institutes the SLSI microbiological laboratory showed the highest percentage increases (180 per cent) in number of clients, but from a relatively low starting level in 2002. With respect to actual numbers the chemical and microbiological laboratory and the calibration laboratory of the ITI showed the highest increases and widened their client base by 190 and 170 respectively
- TTSC remains a provider of testing services for the apparel industry but the number of clients and revenue generated from this sector has decreased. However, TTSC testing services to the textile sector showed the relatively highest increases in revenue generated but from a very low starting level.

3.2. Sustainability of outcomes

The positive outcomes at laboratory level suggest that the UNIDO projects contributed to organizational capacity building at all partner institutes. But what can be said about the sustainability prospects of these capacity building efforts? With a view to capturing the organizational conditions at the partner institutes and their specific efforts to reach sustainability, the evaluators developed a checklist of “sustainability assumptions”, which they applied on the three institutes (see Annex 3). Table 6 summarizes the results of this analysis and shows the similarities and differences of the conditions for sustainable project outcomes at the three institutes.

Table 6: Assessment of sustainability conditions

Sustainability criteria	SLSI	ITI	TTSC
1. Equipment:			
1.1. Laboratory infrastructure	+	+	+
1.2. Climate controlled metrology labs	+	+	NA
1.3. Availability of chemicals and standards	+	+	+
1.4. Repair and maintenance service	-	+	-
1.5. Forward budget for purchase of new equipment	#	#	#

2. Staff:			
2.1. Skilled staff	+	+	+
2.2. *Appropriate remuneration package	-	+	-
2.3. Promotional schemes to encourage performers	-	-	-
2.4. Performance based incentive scheme	-	+	-
2.5. Suitable succession plan	-	-	-
3. Management/governance:			
3.1. Knowledge and experience suitable as per IEC 17025	+	+	+
3.2. Quality concept leveraged across entire organization	-	+	-
3.3. Laboratories operating as profit centres	-	+	-
3.4. Costing methods and pricing strategy	-	+	-
3.5. Dependence on income from mandatory requirements	-	NA	-
3.6. Laboratories able to meet changing demands	-	+	-
3.7. Strategic orientation towards client needs	NA	+	-
4. Accreditation:			
4.1. Scope of accreditation related to country needs	+	+	-
4.2. Budget for annual renewal of accreditation	+	+	+
4.3. Budget for maintaining accreditation	+	+	-
4.4. Budget for staff training for scope expansion	+	-	-

*2.2 – All institutions pay the GOSL stipulated salary scales. However ITI has a scheme for additional allowances to laboratory staff

- GOSL dependent

NA - Not applicable

With regard to ensuring the sustainability of laboratory equipment none of the institutes accounts for depreciation of equipment, which means that all three institutes depend on future Government or project funding for replacing obsolete or deficient equipment. It also means that the prices for testing services do not include capital cost, a fact that might be seen as a hidden subvention leading to possible distortions of the market. Only ITI has an in-house maintenance and repair scheme in place.

Attracting and retaining qualified staff is widely recognized as a critical challenge in many SMTQ projects. From the assessment in Table 6 it appears that only ITI has an allowance and incentive scheme in place for motivation of human resources.

Governance and management issues are also crucial to ensure long-term sustainability of laboratory outcomes. Of course, many of these issues are laid down in the requirements for ISO 17025 accreditation and the laboratories under evaluation abide to these criteria. However, the evaluators used a number of additional organizational and management

criteria, such as leveraging quality across the entire organization, laboratories operating as profit centers and the strategic orientation of service development towards client needs. From this analysis it appears that, to date, only ITI has found proper organizational responses to most of these challenges. Because the constant renewal of international accreditation can be quite costly, the sustainability of accreditation has been another issue in many SMTQ projects. In the cases of SLSI and ITI these challenges are properly addressed, while certain shortcomings seem still to exist at TTSC.

Overall it can be concluded that the expected outcomes at laboratory level have been achieved and that the basic conditions for sustainability are secured at all three institutes. ITI implemented the most advanced and innovative organizational measures.

IV

Project outcomes at company level

Climbing up the causal chain from outputs towards impact, the actual use of testing services by companies and their degree of satisfaction is defined as the next logical level in the intervention theory in Figure 1. The expected generic outcome at company level has been formulated as follows: “The export industry of Sri Lanka uses the testing services provided by the laboratories that were supported by UNIDO and is satisfied”

In order to assess company outcome, a number of boundary conditions need to be looked at: Which other providers of testing services exist? Have companies been using - or even preferring - the services from those other providers? If yes, to what extent and why? In Figure 1 these conditions are called “Utility assumptions at company level”.

As a first step, the evaluators conducted a detailed survey of the relevant public and private testing laboratories and assessed the range of tests offered by them and their respective range and status of accreditation (see Annex 4). Out of 17 public laboratories the five laboratories that were accredited by SWEDAC as a result of the UNIDO projects are the only ones with international accreditation. The laboratory of the National Aquatic Resources Research and Development Agency (NARA) is accredited by the Sri Lanka Accreditation Board (SLAB). On the side of the private sector laboratories one of them is internationally accredited by NABL (India) and some others by SLAB. The accreditation status of two private laboratories belonging to global networks is not clear but the international brand image of these laboratories seems to be sufficient to ensure market share.

To collect information on the outcome and the “utility assumptions” at the company level, a number of qualitative and quantitative company surveys were conducted. For practical reasons, these surveys focused on Sri Lanka’s three major export sectors: garments, tea and fish.

4.1. Use of laboratory testing services by the garment sector

As discussed above, the TTSC garment laboratory is the only laboratory among the three where the number of clients has been decreasing. This finding was further substantiated by the company survey, showing that garment factories rely, whenever possible, on their own in-house laboratories.

In those cases where an independent institution is required, garment producers seem to prefer private laboratories instead of TTSC. Two private laboratories⁴ take the biggest share of the market with 60 per cent and 20 per cent respectively. The reasons for the limited and seemingly even declining market penetration of TTSC are not primarily related to the technical quality of the testing services but to issues of international laboratory recognition and management.

In this connection it should be borne in mind that, in order to cater testing services to the garment exporters it is necessary to obtain accreditation from international retailers and labels who maintain their own standards. Many garment buyers specify particular laboratories from which suppliers should obtain their testing. Therefore the market for testing is not entirely driven by forces of competition.

In order to be competitive under these specific market conditions, the TTSC laboratory had to obtain accreditation from international retailers. In this respect, the private UK based accrediting agency LACE played a key role because it was through LACE that TTSC obtained private accreditation with 10 major UK based retailers (see annex 4 for details). It appears that the problem of obtaining accreditation from international retailers is mainly a marketing issue of penetrating into the well established testing market of international testing service providers. Such private accreditation may even be conditional to the acquisition of specialized testing equipment of a specific brand, which can be quite costly. Despite these efforts on the side of TTSC, many international buyers and brand owners continue to nominate one of the private laboratories as a testing facility for their branded garments.

But also those companies that do use the TTSC laboratory do not seem to be entirely satisfied with the services they receive. Certain weaknesses in diligence, speed of service and lack of ancillary services such as packaging, house-to-house delivery and mailing have been mentioned as reasons why companies would use a private laboratory instead of TTSC. These weaknesses relate to the fact that, different from its private competitors, TTSC does not have a marketing division. It may also be the case that TTSC staff perceived the long-lasting discussions about the possible privatization of TTSC as a threat, with negative influence on motivation and commitment. These organizational

⁴ BVCPS (Bureau Veritas Consumer Products Services Lanka) and SGS

issues tend also to confirm the relative weaknesses of the sustainability efforts at TTSC (Table 6). Price differences may also exist but interviewees perceived them as less important than the problems in service culture.

Views expressed by the Joint Apparel Association Forum (JAAF)

Testing facilities available with TT&SC and Moratuwa University Laboratories and ITI and SGS laboratories were found to be adequate by manufactures. However, for certain highly technical tests manufactures seek laboratory facilities available in India and Singapore. For calibration and other similar services, JAAF membership uses the laboratory facilities available at ITI.

JAAF membership also has observed that there is a price difference (20 - 30 per cent) between private and state laboratories but the services at private laboratories are preferred by the majority of exporters due to very professional approach and most importantly due to turnaround time.

One weakness with state owned institutions is that they do not undertake any promotional programmes and as a result most of the manufactures are not aware of the facilities available in these institutions. For example, while other private sector laboratories make presentations at JAAF meetings with a view to popularize their services, there were no such requests from any of the state sector organizations. Thus, the equipments and facilities provided under UNIDO assistance program are most probably underutilized.

Source: Survey interviews

Several companies and other informants confirmed that TTSC plays an important role when it comes to supporting garment companies with setting up and maintaining in-house laboratories. This aspect is dealt with further down as one of the spill-over benefits of the projects under evaluation.

4.2. Use of laboratory testing services by the tea sector

Extrapolating the sample of companies interviewed under the survey, it seems that the share of the ITI in the market of testing services for the tea industry may be as low as 10 per cent to 20 per cent while SGS, one of the major private laboratories, takes the lion's share of up to 80 per cent. Most tea exporters declare themselves satisfied with the technical quality of the tests carried out by public laboratories but complain about non-technical aspects such as availability of service at required times, one month credit payments and availability of after sales services such as courier service to deliver reports. Prices of the private laboratory seem to be similar or even lower than the ones at ITI.

While the testing services that ITI delivers directly to the tea industry seem to be of limited importance, certain indirect outcomes should not be neglected because ITI laboratories serve the Sri Lanka Tea Board, the regulatory body which oversees tea related research, promotion and development activities. Tea exporters are required to seek mandatory certification of compliance with the regulatory sanitary requirements for tea exports, which the Tea Board is granting, based on microbiological and chemical test

results from its own laboratory. This laboratory is currently not accredited by ISO 17025 but has the capability to carry out all the necessary microbiological and chemical tests for tea with the exception of pesticide residues, which is outsourced to the ITI laboratory.

4.3. Use of laboratory testing services by the fishery sector

Since the 1990s the export of fresh tuna, in particular to the EU, has become a major earner of income in the fishery sector. In line with EU regulations, this sector is supervised by the Department of Fisheries and Aquatic Resources (DOFAR) in its capacity as “competent authority” for the quality of fish exports from Sri Lanka. The DOFAR has officially authorized ITI, SGS and the National Aquatic Resources and Research Agency (NARA) as providers of fish testing services.

While both SGS and NARA are accredited either by NABL or by SLAB, the DOFAR decided to use ITI as their official laboratory for analyzing the samples collected by them in their official sampling plan. This program covers all exporters of fish and ITI receives samples every week from DOFAR. A recent inspection by the veterinary office of the EU mentioned ITI as a high quality provider of testing services in Sri Lanka and confirmed that the quality system for fish exports responds to EU standards. It is therefore safe to say that the UNIDO intervention leading to ITI’s accreditation to ISO 17025 has had a major positive influence on Sri Lanka meeting EU requirements.

The survey among fish exporters seems to indicate that the private laboratory takes about 50 per cent of the market for testing services in the fish industry, while ITI is in for about 30 per cent and SLSI for about 10 per cent. Technically, ITI comes out very strong from the survey because it offers the broadest coverage of mandatory tests (6 out of 8, as compared to only 5, 3 or 2 for its competitors) and customers are highly satisfied with the quality of the tests.

Certain similarities with the tea sector emerge: fish exporters seem to have a certain preference for private laboratories because of non-technical reasons such as superior customer orientation and service culture but, in its capacity as an internationally accredited laboratory, ITI plays an important systemic role as a provider of authoritative testing services to the “competent authority”.

4.4. Use of calibration services

Under the UNIDO projects, the ITI became Sri Lanka’s first internationally accredited calibration laboratory for temperature, mass, dimension, volumetric and electrical, measurements. Accreditation for pressure and force is still outstanding.

In the absence of a fully functioning National Metrology Institute the International Laboratory Accreditation Cooperation (ILAC) accepted ITI as the source for traceability. Testing laboratories seeking international accreditation depend on ITI because accreditation bodies insist on accredited calibration of measuring equipment. For organizations with ISO 9000 and ISO 14000 certification, calibrations of their measuring equipment with traceability to international standards are mandatory. Previous to the accreditation of the ITI calibration laboratory, ISO certifications were granted on the basis of SLSI's traceability established through NIST and KRISS. When the ITI accredited calibration lab came into operation, the situation improved because assessors of certifying bodies had third party assurance on traceability

With these requirements as well as the numbers of ISO 9000 and ISO 14000 certified entities in the country showing a noteworthy upward trend, the clients utilizing this service and the revenue generated showed a steady and significant upward trend. It is interesting to note that all actions with respect to mass and temperature calibrations showed a significant increase of about 30 to 40 per cent in 2005 which was the year following the award of accreditation. A similar effect however was not noted subsequent to the award of accreditation for dimension, volumetric and electrical.

Food and beverage manufacturers and exporters use the facility to maintain the accuracy of measurement equipment to assure quality of their products. Some of the major users of the facility are Unilever Ceylon Ltd, Ceylon Biscuits Ltd, Fonterra Brands Lanka (Pvt) Ltd, Prima Ceylon Ltd, and CBL Foods International (Pvt) Ltd. In-house laboratories of apparel manufacturers using this service increased from 17 in 2002 to 42 in 2008. Some of the major users of the facility are leading apparel manufacturers such as Crystal Sweater Lanka (Pvt) Ltd, Bodyline (Pvt) Ltd, Casual Line (Pvt) Ltd, Coats Thread Lanka (Pvt) Ltd, Hidramani Garments Ltd, Slimline (Pvt) Ltd, Smart Shirts (Lanka) Ltd,

Manufacturing companies in the rubber, packaging, plastic, steel, graphite, detergent, glass, leather, cosmetic and ceramics industries and also those exporting fresh fruits and vegetables use ITI calibration services, although often only on a 'one off' basis or for two to three calibrations per year. Calibration services are also provided on a regular basis to many Board of Investment (BOI) companies such as the Toroid Group, Loadstar (Pvt) Ltd and Motherson Electrical Wires (Pvt) Ltd. With respect to service sector clients the National Lotteries Board, Ceylon Electricity Board, hotels, trading companies, engineering, communication and construction companies use calibration from the ITI.

A very significant calibration user has been the Colombo Dockyard PLC which is now Sri Lanka's largest engineering facility leading in the business of ship repairs, shipbuilding, heavy engineering and offshore engineering. Table 7 shows the significant increase of calibration services used by this important client.

Table 7: Calibration services delivered to the Colombo Dockyard

Institution	SLSI			ITI		
	2006	2007	2008	2006	2007	2008
Year under review						
Number of times the services were used	15	20	21	33	57	55
Cumulative Cost, Sri Lanka Rupees (LK Rs.)	81,800	100,400	141,850	679,900	999,550	1,287,450

Source: Figures provided by Colombo Dockyards

Medical testing laboratories of Asiri Hospital and Nawaloka Hospitals (Pvt) Ltd (the leading private hospitals in Sri Lanka having ISO 9000 certification) persisted in using the ITI calibration facilities whilst several other medical laboratories viz. Confidence Medical Centre (ISO 15189 accredited) and the laboratories that are in the process of implementing ISO 15189 QMS, viz: Ceymed Health Care Services (Pvt) Ltd, Medi Spot Ltd, Vindana Reproductive Health Centre, and Wayamba Diagnostic Laboratory are some of the other laboratories who sought services from the ITI.

V

Spillover benefits

Laboratory support projects such as the ones evaluated here work under the assumption of wider unspecified, indirect and unexpected benefits, in addition to or generated by the direct outcomes of accredited testing services. Evaluating such assumed benefits (also called “spillover benefits”) is of course difficult, as the exact areas and ways how these may occur are not accounted for during project design.

The present impact evaluation gave particular importance to the identification and assessment of spillovers. Evaluators looked into four different hypotheses how such systemic spillovers may have occurred:

1. The first hypothesis has been that UNIDO projects may have contributed to a more competitive market for testing services, leading to lower cost and better quality of testing services.
2. A second hypothesis has been that the capacity of the partner organizations to respond to new unexpected challenges may have improved.
3. The third hypothesis are possible spillovers with regard to knowledge flows within Sri Lanka that may have lead to systemic improvements of certain elements of the National Quality System (NQS) outside the three partner institutes.
4. A fourth hypothesis for spillovers has been that knowledge flows from Sri Lanka to some of its neighboring countries and subsequent improvements of the NQS of these countries may have occurred.

It seems that the hypothesis of increased competition has materialized. In the past, laboratories abroad were often the only possible choice for certain tests. The market survey carried out under this evaluation (Annex 6) shows that the prices for testing services in Sri Lanka are significantly lower than prices in reference countries such as Malaysia, Singapore and Hong Kong. In that sense, it is quite clear that Sri Lanka industry has been reaping considerable price benefits from the UNIDO intervention.

However, as already mentioned above, one of the reasons for low testing prices at public laboratories are hidden subsidies due to not including depreciation costs. Here, the evaluators recorded different points of view among stakeholders. While private

laboratories stressed the unfair competition argument, others pointed out that the presence of public laboratories may have prevented the market from developing monopoly price structures. This issue is subject to recurrent debate and a point of discussion in UNIDO SMTQ interventions also in other countries. A closer look at the “public goods” argument and developing a deeper understanding for which SMTQ services this argument applies and for which it doesn’t would probably be worthwhile. It could be argued that testing for inspection and regulatory purposes is a public good that should be provided by public laboratories. The case of public institutes delivering commercial testing services to private customers is different. Here, the argument for public intervention would be overcoming market imperfections that may be due to unfair competition or to monopoly structures. However, safeguards have to be built into project design to make sure that projects indeed overcome market imperfections instead of distorting the market for testing services.

Against this background, it is safe to say that the UNIDO interventions in Sri Lanka produced positive spillover benefits with regard to increasing competition; that no crowding out of private laboratories could be observed; that prices and technical quality of testing services from public and private sources converge; that competition is working both ways and moving from technical to non-technical aspects, which puts public laboratories under pressure to improve their service culture.

With regard to the second hypothesis, the evaluation found evidence that the capacity of the partner institutes (more specifically of ITI) to respond to unexpected challenges has improved in at least two respects:

- Towards the end of 2003, the EU introduced the mandatory requirement that all spices and related products should be free of non permitted colors viz. sudan, I, II, III and IV and that all consignments to the EU should be accompanied with a test report providing assurance that the products are free of sudan colours. The spice industry at this time faced a crisis on this issue and ITI reacted by developing the required test methods. The food regulators of the importing countries accepted ITI reports due to the fact that ITI laboratories complied with the ISO 17025 (QMS).
- A more recent example of an unexpected challenge was the requirement for testing for melamine following the Chinese milk powder contamination scare. In the wake of this contamination alarm in October 2008, Sri Lanka's Health Ministry banned the import and sale of 60 food products as a precautionary measure and the impact of this ban was severe on the milk and milk based food producers and marketers in Sri Lanka. None of the private and public laboratories in the country were equipped to carry out the test for melamine, with only a few laboratories in the world having this capability and capacity. Initially Sri Lanka obtained the services from a reputed laboratory in Singapore. Quite rapidly, the ITI stepped in with its quality infrastructure, state-of-the-art facilities and internationally trained expertise and

established a new testing method as per the US standards. The facility was extensively used by the GOSL, regulatory authorities and the private sector including companies marketing milk powder and manufacturers of milk based products.

Regarding the third category of spillover effects, a number of knowledge flows from direct project partners to other parts of the Sri Lanka NQS could be observed, such as the following:

- While TTSC has difficulties to compete with private providers of testing services the same organization seems to be playing a role with helping apparel manufacturers to set up, operate and maintain their in-house testing laboratories.
- The ITI rendered technical assistance to medical testing laboratories in implementation of ISO 15189 QMS. ITI has the credit of providing consultancy to the first SLAB accredited medical testing laboratory and has so far provided consultancy to three other laboratories. A significant feature is the guidance provided in calculation of uncertainty of measurement to medical laboratories.
- State sector organizations such as the Coconut Development Authority (CDA), Veterinary Research Institute (VRI) and CEA have sought the assistance of ITI in development of QMS along with laboratories of private sector organizations such as MJF Teas, Finlays Teas and Lindel laboratory.

Regarding the fourth hypothesis of knowledge flows from Sri Lanka to other countries the evaluation found ample evidence that such spillovers occurred. Annex 5 lists the international training, consultancy and calibration services provided by ITI staff between 2005 and 2009. At least seven countries benefited from ITI services: Pakistan; Cambodia; Lao PDR; Vietnam; Bangladesh; Maldives and Ghana. More specifically, the following cases of South-South technical assistance are to be mentioned here:

- ITI provided on-site calibration services (for balances) to a total of 17 laboratories at the following public institutes in Pakistan: PCSIR (Lahore & Karachi), PSQCA (Karachi), Leather Research Centre (Karachi), Grain Quality Testing Laboratory (Karachi & Islamabad), Marine Fisheries Department (Karachi), Leather product & Development Institute (Sialkot) & National Textile University (Faisalabad).
- ITI loaned expertise in the field of histamine analysis to the Marine Fisheries Department of Pakistan to obtain internationally recognized accreditation. The assistance included the development and validation of the test method, review of quality manual and procedures, establishment of quality assurance practices, calculation of measurement uncertainty and participation in proficiency testing.
- In 2009, the ITI hosted a team of seven laboratory personnel from the Department of Fisheries of Bangladesh to provide them an overview on meeting the requirements of

global trade with respect to export of fish. In this program ITI enabled the visitors to have interaction with DOFAR, which is the Competent Authority of Sri Lanka for export of fish to EU countries.

- A training program for four laboratory personnel from Ghana on implementation of ISO 17025 QMS for microbiological testing and one from the Republic of Maldives for testing of water was conducted. Three laboratory personnel and the director of the calibration laboratory of the BSTI were provided training in mass and temperature calibrations. A request has also been received for training of nine laboratory personnel from Nigeria in the area of chemical and microbiological testing and pesticide residue analysis.

This dimension of increased South-South knowledge flows and cooperation has been one of the most remarkable spillover achievements of the projects under evaluation.

VI

Impact at company level

The next higher level of the intervention theory in Figure 1 defines the expected impact at company level as:

“Improved export performance of users of testing services”

It is legitimate to expect evidence from an impact evaluation whether exporters did actually improve their performance because of using testing services from the three institutes. However, the reality is more complex. Of course, improved export performance of companies cannot be attributed to the sole UNIDO intervention, which is why the often quoted “attribution gap” becomes particularly apparent at this level of analysis. A key question to be answered by the surveys among importers and exporters has been to what extent exporters perceive the availability of accredited testing services from national laboratories as critical or whether, in some cases, they might be just “nice to have”. This is so called “relevance assumption” (Figure 1).

As expected, the evaluation encountered two problems:

- A conceptual problem because, for obvious reasons, a “control group” of companies that refrained from using testing services does not exist and cannot be construed;
- A practical problem because companies consider information on their export performance and competitiveness as highly sensitive and are not prepared to share quantitative data on these points.

Nevertheless, the evaluation was able to shed additional light from two different sides on the pivotal linkage between quality infrastructure and export performance:

- Sectoral macroeconomic analysis – This allowed developing a better understanding of the export performances of the three sectors and of the variety of external factors that influenced these performances over the evaluation period.
- Structured interviews with major importers in industrialized countries that are sourcing products of the three sectors not only from Sri Lanka but also from other developing countries – This allowed a better understanding of key player perceptions of Sri Lanka’s strengths and weaknesses as an exporter of quality products.

In the light of the above, the evaluators attempted to provide plausible answers to the following questions: What are the structures and trends of exports of quality products from the three sectors? How important is laboratory testing as compared to other trade related factors? To what extent are other important SMTQ challenges being met?

6.1 Impact on the garment sector

The garment sector in Sri Lanka is a large and vibrant industry that caters almost entirely to the international market (around 95 per cent of industrial output in the sector is exported). In 1977 export earnings were around US\$ 10 Million and by 2007 export earnings had reached US\$ 3.2 Billion. A major contributor to the growth of the garment sector has been the guaranteed availability of quotas to Western markets through the Agreement on Textiles and Clothing (ATC). In 2007 garment exports accounted for 40.5 per cent of total exports. Along with its contribution to GDP and exports, the sector has been a major source of Foreign Direct Investment (accounting for approximately 10 per cent of realized investment up to the end of 2006) and employment.

Garment sector exports grew slowly between 2000 and 2004 and more rapidly from 2005 to 2007. A major concern in the garment sector was the expiry of the MFA quotas in 2005. Given the fact that 60 per cent of Sri Lanka's total garment exports and nearly 90 per cent of garment exports to the U.S (Sri Lanka's major garment market) was in quota governed items, the ability of Sri Lanka to compete with the expiry of the quotas was called into question at the time. However, there has been a growth spurt in export value since 2005.

Sri Lanka pursued various initiatives in the sector in order to overcome the challenges of the post quota era. The most important of these was obtaining the preferential trade regime called "GSP+" from the European Union. Technological innovations included the use of modern machines for designing, grading, cutting and dyeing and the use of IT in production. Human resources have been developed by the introduction of a graduate diploma in apparel marketing and a Bachelor of Design programme at the University of Moratuwa. Several other degree programmes and technical courses related to textiles, design and fashion marketing have been introduced in collaboration with major foreign universities such as RMIT University Australia, North Carolina State University and London College of Fashion.

The positive effects of these efforts are quite obvious. Major buyers interviewed by the evaluation team consider Sri Lanka's production and innovation system for garments as highly integrated, flexible and adaptive. They consider the innovation capacity of this national "mega-cluster" as a very important factor influencing their purchase decisions from Sri Lanka. In the eyes of its customers, the Sri Lankan garment industry has gained one of its strongest competitive advantages from being highly innovative. As such, Sri

Lankan garments have secured certain high value niche markets such as the market for intimate apparel. Of course, the ability to ensure quality in such markets is extremely important but, in an advanced production system like this one, quality is being addressed in a highly integrated fashion by in-house laboratories, private standards and private accreditation systems driven by international buyers and brand owners.

Another key innovation has been in marketing and projecting Sri Lanka as a high quality, ethical producer under the 'Garments without Guilt' slogan. Some of the bigger firms have engaged corporate social responsibility (CSR) programmes, particularly focused on female workers, or commenced operations in 'Green Factories' catering to demand of a major UK based buyer. The rationale for implementing this kind of eco-systems is two fold. Interviewees mentioned increased electricity costs as a major bottleneck pointing out that the Sri Lankan suppliers had to find ways to increase energy efficiency if they wanted to remain competitive in an extremely competitive international market. On the other hand, the eco-projects in Sri Lanka's garment industry include the setting up of water turbines for energy efficiency, refurbishments to make plants eco-friendly etc. The fact that one specific plant has been able to cut its carbon footprint by 80 per cent is being used as an additional sales argument. Cutting edge exporters seem to be building their competitive advantage increasingly on social standards and renewable energy and environmental arguments.

In conclusion, there has been a multitude of efforts that contributed to maintaining the competitiveness of the Sri Lanka garment industry in the post MFA environment, such as enhanced national training opportunities for designers and textile engineers; penetration into high value added niche markets; aggressive marketing of compliance with social standards and CSR initiatives as well the greening of the Sri Lanka garment industry.

Against this background, the most significant contribution of the UNIDO projects to safeguarding and improving the export performance of Sri Lanka's garment industry came probably from the accreditation of the ITI calibration laboratory, which provides regular services to the industry, to in-house laboratories as well as to private testing institutes. The highly effective production and innovation system of the Sri Lanka garment industry has clearly benefited from the presence of an accredited calibration laboratory.

There is also evidence that the ITI chemical laboratory contributed through wastewater effluent testing services for many factories in the apparel sector. As early as October 1998, major buying houses like NIKE and GAP had already recommended that all Sri Lankan companies selling products to these brands should obtain wastewater analytical reports from ITI. Subsequently, around 50 to 60 of the more than 800 apparel manufacturing companies in the country have regularly used the ITI facilities for monitoring of waste water to environmental standards. The increase in capacity and sustenance of all these services were possible due to the UNIDO/NORAD intervention

and the accreditation that was received by the ITI. The international accreditation status played a major role to be a strong competitor in the scenario that private sector labs (such as SGS) were gaining this status.

The contribution of the TTSC laboratory becoming accredited to ISO 17025 under the UNIDO project is probably limited. As explained further above, the industry mostly relies on its own testing infrastructure or on private laboratories. Furthermore, ISO 17025 accreditation is of minor importance as compared to private accreditation schemes. However, it appears that one of the private laboratories outsources tests such as color fastness and flammability in textiles to TTSC as they are not equipped to carry out these tests.

6.2 Impact on the tea sector

Behind garments, tea is the second largest export Sri Lanka although it contributes only with 1.4 per cent to GDP. In 2007, tea exports amounted to US\$ 1052 Million, contributing 13.25 per cent to total exports, Ceylon Tea is known worldwide for its quality and has thus been able to command relatively high prices on the world markets. However, in some European countries and in particular in the UK, over the last 15 years a trend towards substituting Sri Lanka tea by tea from East-Africa can be observed.

Today, the major buyers of Ceylon Tea are the Middle East and Russia. The Middle East accounts for almost half of total exports of tea from Sri Lanka. A similar situation prevailed already in the year 2000 (Middle East 45.5 per cent and Former Soviet Union 19.7 per cent) and has not changed since. Tea exports to the European Union and Japan make up other buyers whilst the United States is a small market for Sri Lankan tea, accounting for just 1.75 per cent of tea exports. Among EU countries, Finland, Germany and Poland are the biggest consumers, accounting for around 1.75 per cent of tea exports from Sri Lanka each.

The government has emphasized the importance of maintaining high value added quality tea exports from Sri Lanka in its Ten Year Development Plan, which states that assistance will be provided in branding Ceylon Tea and will promulgate labeling and packaging requirements for brands claiming “Pure Ceylon Tea”.

The ITI and SGS laboratories provide testing services for pesticide residue and microbiological quality. As a requirement for HACCP certification which is prerequisite for export of tea and processed foods (as well as raw materials used for processing) to EU countries, pesticide residue analysis is undertaken to assure safety of tea and processed foods. In addition, Japan imposes stringent Minimum Residue Levels (MRLs) for pesticide residues in tea. The ITI was capable of meeting this demand as the facilities needed and the QMS was in place. The availability of this service at the ITI was

advantageous to the country as a whole since Japanese customs accept reports only from GOSL laboratories. Even though two other laboratories viz. the Tea Research Institute (TRI) and SGS are in a position to partially cater to this need, only ITI has the capabilities to analyze a majority of the pesticide residues listed by EU and Japan. It should be mentioned, however, that ITI is not accredited for pesticide residue tests, which shows that accreditation is not always required for a public laboratory to play its role as a reference institute.

Because tea export growth in Sri Lanka has been mainly driven by price increases, the impact of UNIDO interventions on the growth of tea exports is probably low. However, UNIDO did make contributions towards HACCP certification by making available accredited microbiological testing facilities at SLSI and ITI and it was also critical for tea exports to Japan. It seems that the UNIDO intervention on export to Sri Lanka's major tea consumers, the Middle East and Russia was comparatively only minor.

6.3 Impact at the fisheries sector

The fisheries sector overall contributed Rs. 55 Billion to GDP in 2007, accounting for 1.5 per cent of GDP. In 2006, 75 per cent of total fish production was for the domestic sector, whilst 9 per cent was for the export sector and 15 per cent was dried fish. Fish exports amounted to Rs. 13.7 Billion in 2007, which is 1.6 per cent of total exports. In addition, crustacean and mollusk exports amounted to Rs. 3.9 Billion and salted fish exports were a smaller proportion and amounted to Rs. 386 Million.

Between 2000 and 2004 fisheries exports grew at a modest rate. Quite paradoxically, a surge in exports occurred after the Tsunami that struck on December 26th 2004. Much of the fisheries infrastructure and fishing communities were damaged which resulted in a substantial drop in fisheries contribution to GDP⁵. The export sector however continued to grow during this period with particularly high growth rates from 2005-2007. This may be connected the substantial recovery efforts in the sector with donor assistance provided to obtain new boats and develop fishing harbours.

Another factor that contributed to the rapid growth of fish exports in the recent past has been the expansion of exports to the EU following Sri Lanka's accession to the preferential trade regime GSP+, which enabled duty free access for Sri Lankan exports to the EU. At the same time, there has been a shift in demand from the European Union towards Sri Lankan fish due to the availability of Tuna with lower incidence of heavy metals and toxic compounds.

⁵ Contribution to GDP fell from Rs. 33.5 Billion in 2004 to Rs. 19.2 Billion in 2005 before recovering to Rs. 35.2 Billion in 2006.

Against this complex background of major market trends and radical structural changes in the fisheries sector after the tsunami – is it realistic to say that the UNIDO projects have made a significant contribution to improving the competitiveness of Sri Lanka’s fish exporters?

There is evidence that the UNIDO intervention at the ITI and SLSI laboratories contributed to building technical capacities for the country to grasp the opportunities arising from major external factors such as GSP+, market preference for low residue tuna from Sri Lanka and the positive world market trends in the international trade of fresh fish.

A recent inspection by the veterinary office of the EU found that Sri Lanka’s quality system for fish exports under the leadership of the MFA as the national “competent authority” responds to EU standards and explicitly mentioned ITI for the positive contribution of its laboratories.

Major fish exporters and importers confirm this positive assessment. Traders perceive Sri Lanka’s quality system as superior to some of its competitors and the UNIDO intervention has certainly contributed to this. However, while technical laboratory problems seem to be largely solved, attention is shifting from technical to structural issues. Interviewees expressed concerns that corruption problems might undermine the credibility of HACCP certifications of fish producers and that the credibility of the quality system might be suffering from the absence of proper checks and balances. In addition, new traceability challenges arise from fraudulent fish imports to Sri Lanka. It may therefore well be that future technical assistance will have to reflect these trends and move from a technical to a more systemic approach.

6.4 Impact of calibration services

In the area of calibration the main requirements of clients are measurement traceability and international accreditation. Therefore, clients in Sri Lanka utilize services from the ITI or the SLSI, the latter in cases where international accreditation is not required. In cases like the SGS laboratory (accredited by NABL, India), where an internationally recognized accreditation facility is mandatory the ITI services are utilized.

In case the ITI calibration facility had no internationally recognized accreditation status, SGS would have had to send equipment overseas for the necessary calibrations at extremely high cost. This would have reflected on the pricing of the SGS service that would have been ultimately passed down to the client.

Colombo Dockyard Case

In the area of industrial metrology, the case of the Colombo Dockyard is instructive. This dockyard has developed from a relatively small government owned concern in the 1950's into a large multi-national private concern selling sophisticated ship repair services and constructing complex and technically demanding oil and gas exploration vessels. The company is part owned by Japanese investors but is otherwise wholly Sri Lankan. The shipyard also builds vessels for and supports the Sri Lankan Navy. The company has 1,643 permanent staff and contributes Rs.2 billion a year in wages alone to the local economy.

The company has seen substantial growth (19 per cent and 29 per cent year-on-year growth in ship repair and shipbuilding from 2007 to 2008) and high levels of domestic value addition (>60 per cent). Main competitors are yards in India, Dubai, Bahrain and Singapore. In terms of quality reputation, the CEO places his company's reputation among its customers on a par with Singapore, but below the market leader, Norway, for specialist oil industry vessels. This means that since starting in this sector in 2006 they have surpassed China, India, Indonesia and Malaysia. They believe that they are nearly able to match Norway on delivery time.

Local availability of calibration is essential to the business model of the Dockyard and the total number and also cost of services is growing substantially year on year as shown in Table 6. However, the most important factor is not cost but turn-around time of calibration services. Here, the company complains that it has difficulties to persuade ITI and SLSI to work to strict schedules including weekends or holidays (Sri Lanka has an exceptional number of public holidays, so this is important).

Source: Interviews conducted by evaluators

The ITI calibration prices are generally lower than those in the region (Annex 6). But it is not only the price argument that counts. When calibrating equipment abroad many other additional charges such as packing/unpacking, loading/unloading, transportation, insurance, customs, bank commissions, processing charges etc. have to be considered. There is also the case that in some instances equipment cannot be transported and has to be calibrated on-site in the owner's laboratory, which means that yet another type of fee for transportation of personnel, DSA, hotel charges etc. will be involved. The time factor will be another disadvantage from the point of view of the clients.

A number of interviews were carried out with representatives of major users of calibration services. These interviews illustrate the impact as follows:

- Service sector client – The calibration of equipment has become a necessity mainly after obtaining ISO 9001 certification. If the ITI facility was not available equipment will have to be sent to Singapore. As this will be expensive it will not be possible to do all calibrations that are now presently done. There is also the need for a quick service. This will also not be possible if not for the ITI.

- Medical testing laboratories that are ISO 15189 accredited or in the process of implementing ISO 15189 said that, if the ITI facility was not available, the equipment agent would have to be requested to obtain calibration facilities. The cost through the agent is extremely high and this would have had to be passed down to patients seeking medical reports.
- Accredited testing laboratory client – All equipment calibrations are obtained from the ITI since the ITI Calibration lab is accredited by an accreditation body that is a signatory to ILAC MRA as this is a requirement of the accreditation body, NABL, India. In the case of autoclaves, there was a problem since ITI is not accredited for pressure but NABL agreed to accept ITI calibration and a time target has been set for ITI to get accredited for pressure calibration.
- Manufacturing sector client – Calibrations are required mainly after ISO 9000 certification and presently this is obtained from ITI. If there was no accredited calibration facility in the country, calibrations would have to be done by the Mother Company in Italy which would be extremely expensive for the local company with a direct bearing on the profits.

VII

Impact at society level

Societal impact ranges at the highest level of the intervention theory (Figure 1) and has been defined by the evaluators for the purpose of this evaluation as:

“Positive influences on better/more jobs; alleviation of poverty; improving gender balance; environment; public health; and others”

Of course, it will not be possible to “attribute” such impact to the UNIDO intervention – even less so than attributing outcomes at lower logical levels. However, possible routes by which societal impact may have occurred can be identified and tested for plausibility. Furthermore, possible “impact prohibitors” and “impact drivers” can be identified that the project may, or may not, have tried to influence in order to increase impact.

7.1 Society impact of increased garment exports

The garment sector is the single most important employer in Sri Lanka’s manufacturing sector. The most recent industrial survey states that employment in the sector stood at 330,000 in 2004 representing about 30 per cent of manufacturing employment (around 5 per cent of total employment). A major feature of employment in the sector is that 87 per cent of employees are female. Although the bulk of these are in the lower grades, the garment sector provided employment opportunities for a part of the female population who traditionally had no access to industrial employment at all.

Labour legislation ensures that wages are, at least theoretically, above the poverty line although critics claim that “the minimum wage in the apparel sector is among the lowest in the Asian region (USD 56 per month) for an eight hour working shift. In addition, the government for the current year has frozen the national minimum wage increases recommended by the State wage fixing body. These conditions compel workers to

perform exhaustive overtime hours on a regular basis in order to earn even a meager income.”⁶

Quite clearly, there seems to be still ample room – and also opportunities – for improvement. As compared to other countries, the Sri Lanka garment industry serves relatively sophisticated markets that are driven by increasing buyer awareness of labour and environmental standards. Positive impacts of increased trade on poverty alleviation and on the environment are therefore more likely to occur in this sector than in others. CSR initiatives of some of the bigger players in the Sri Lanka garments industry such as “Garments without Guilt” or the push for “greening” the garments industry can be considered strong “impact drivers”.

7.2 Society impact of increased tea exports

In the tea sector, a positive “trade poverty link” is even less likely than for garment. Employment in this sector is over one Million, including direct and indirect employees. The sector is important in its link with poverty, with the highest incidence of poverty being found in the estate sector, where tea plantation takes place to a great extent.

Although wages in the tea sector were increased following industrial action in 2006, these wages are still below the poverty line. As of 2007, the average daily wage earned in the sector is Rs. 378 for men and Rs. 261 for women. To be above the national poverty line requires expenditure of above Rs. 2,924 per person per month as of April 2008. Thus, a female headed household in the estate sector with four members including just one provider, who works a full 30 days, would have a per capita income of Rs. 1,958, which is clearly below the poverty line.

With regard to the potential impacts on gender and poverty, the tea sector has provided livelihoods but not empowerment to the women working in the sector. Like the garment sector, tea provides substantial employment to women, but the bulk of it is very low skilled employment with incomes much lower than in the garment sector. The increasing poverty in the estate sector between 2002 and 2007 is evidence that the poverty impact of tea exports has not been positive, largely due to low skilled workforce and political dimensions of poverty (rights; influence; freedom)⁷.

This weak “trade poverty nexus” in the tea industry is being addressed by several “fair trade” initiatives. The evaluators conducted a case study on one of the major players in the fair trade segment, a German tea importer, which is also a member of the European

⁶ Friedrich Ebert Stiftung (2008); EU’s preferential Trade with Sri Lanka: Waste of Tax Money or Modern Development Policy?

⁷ OECD (2007); Promoting Pro-Poor Growth, Policy Guidance for Donors

Fair Trade Association (EFTA). This importer serves Germany and other markets such as Austria where consumers are prepared to pay a premium for fair production. The importer is sourcing its tea from a specific micro-region and there seems to be evidence that poverty alleviation in this area is more advanced than in other tea growing areas. The intermediary company in Sri Lanka takes also care of implementing the fair trade benefits in the production area, such as health and school infrastructure.

However, “fair trade” tea represents only a minor part of Sri Lanka’s tea exports. Most of Sri Lanka’s tea exports are directed towards emerging markets with limited consumer awareness of labour and social issues. As far as tea is concerned, the poverty alleviation impact of the UNIDO projects seems therefore to be rather limited. It may well be that targeting efforts more towards promoting “fair trade” tea exports could have been a possible “impact driver”.

7.3 Society impact of increased fish exports

As of 2004 there were 170,000 fishermen in Sri Lanka and the fishing household population is estimated at 612,000. Figures for 2005 are available (162,000 fishermen) but are not an accurate reflection of the sector due to the impact of the Tsunami in December 2004.

Whilst official sectorwise poverty data is not available, fishing communities have traditionally been low income households. In 2002 there was substantial levels of poverty in areas where fish production was most prominent. The national average poverty head count in 2002 was 22.7 per cent. Most recent poverty data suggests that post tsunami assistance has improved incomes in the Southern coast in particular.

However poverty was less of a problem in the non-traditional fishing sector which caters to the export market. The average crew member in a multi-day fishing boat (used for exports) earned LKR 30,784 per month (in 2004) which is substantially higher than the average earnings of Rs. 5111 for a fishermen in a traditional boat. Both were higher than the poverty line of Rs. 1526 (minimum per capita monthly total consumption expenditure) in 2004.

The available information and data allows to conclude that increased fish export does produce positive impact on jobs, income and poverty reduction. Illegal and fraudulent fish imports could be however a possible “impact prohibitor” because in these cases is sourced off-shore from trawlers of unknown nationality. The industry is aware of this issue and some of the major exporters have contacted the “Marine Stewards Council” to develop a private certification mark and traceability initiative. Similar to parallel initiatives in the garment and tea sector such initiatives would have the potential to

enhance the positive impact of trade capacity building on poverty alleviation and on the environment.

7.4 Society impact of calibration services

Calibration is a typical enabling function that permeates the entire economic fabric. The potential for society impact is therefore considerable but, in most cases, the causal chain from calibration to society impact is even longer and more difficult to straighten out than for product and process testing. From the information collected it becomes clear that the UNIDO/NORAD intervention at the calibration laboratory of ITI has been successful not only from the point of view of the calibrations performed for industry but also to meet the requirements of the Sanitary and Phytosanitary (SPS) and the Technical Barriers to Trade (TBT) agreements. In the absence of a functioning National Metrology Institute, the internationally recognized accreditation of the ITI laboratory is significant in this context because test reports from accredited laboratories have become mandatory in keeping with the above mentioned agreements.

Calibration of medical testing equipment is a case with a relatively straightforward impact chain from calibration to society impact (health). Calibration of medical equipment contributes to the accuracy of medical analysis in Sri Lanka, although it would be more difficult to demonstrate significant impact on the improvement of the public health system at large and in particular on those parts of the system that are serving the poor.

The case of the Colombo Dockyard described above illustrates the crucial importance of calibration services for industry, in particular for the more advanced manufacturing companies that are competing on a global scale. There is no industrialization without a well functioning and internationally accredited calibration system.

Because UNIDO calibration intervention in Sri Lanka has been with ITI and not with the Measurement Units, Standards & Services Department (MUSSD) the projects evaluated here did not have a significant impact on improving Sri Lanka's Legal Metrology system. From the point of view of a potential impact on poverty alleviation this is unfortunate because it is widely recognized that improvements in Legal Metrology, in particular of its outreach to rural areas and to the informal sector of the economy, bears considerable potential for poverty impact. Theoretically, MUSSD could have benefited from ITI accreditation by sending equipment to ITI for calibration. However, over the years, MUSSD has not requested such services from ITI.

VIII

Recommendations and lessons learned

This Impact Evaluation was conducted in parallel with the Thematic Evaluation of UNIDO activities in the area of SMTQ. Both evaluations were closely linked, with findings and lessons learned being fed back both ways as they emerged.

The Thematic Evaluation produced a comprehensive array of detailed recommendations under the following nine headings:

- a) Needs driven and long-term project preparation:
UNIDO should develop and adopt a structured and in-depth approach for SMTQ project preparation. Processes for project preparation should be clearly defined and consistently applied by all members of the TCB branch across the entire SMTQ portfolio.
- b) Contribute to improved governance of National Quality Systems:
Building on its comparative advantage as a “neutral broker”, its thematic leadership and political weight, UNIDO should assist governments with reducing systemic failures of National Quality Systems (unclear responsibilities; duplications; frictions) by introducing more effective governance/steering structures and developing long-term “Master Plans” for NQS development.
- c) Private sector involvement:
UNIDO should further develop its recent move towards a stronger involvement of the private sector in SMTQ projects.
- d) More comprehensive approach to capacity building and change management at partner organizations:
UNIDO should adopt a more comprehensive and long-term approach to institutional strengthening that takes into account organizational development and change management principles and goes much beyond technical training.

- e) Regional and South-South cooperation:
UNIDO should further develop its leadership in stimulating regional and South-to-South cooperation
- f) Enhance national ownership and decentralize project implementation:
UNIDO should further develop its implementation mechanism, strengthen project governance and project management structures and coordinate with other UN Agencies
- g) Good project management practice (RBM):
UNIDO as a whole should further improve its internal quality control framework and the TCB should develop its own internal mechanisms and responsibilities to ensure the consistent application of good project management practices across the entire branch
- h) Act as “One UNIDO” in TCB projects:
Clarify and streamline roles and functions of “substantive branches” and overcome operational challenges between UNIDO “substantive branches” and “service branches” through better integration of service branches into the project cycle at an earlier stage.
- i) Dialogue with donors:
UNIDO should intensify its dialogue with the donor community and build awareness among donors on a number of key findings that emerge from the thematic evaluation.

Because many recommendations of the Thematic Evaluation are built on the findings of the present Impact Evaluation it has been decided that, for conceptual and practical reasons, the recommendations of the Impact Evaluation will be followed up under UNIDO “Management Response” mechanism for the Thematic Evaluation.

However, it is worthwhile to retain the following main lessons learned that emerged from the impact evaluation:

- UNIDO has contributed to sustainable capacity building at the public testing laboratories. The evaluation report offers a check list of “sustainability assumptions” that should be used in future interventions (ex-ante and during implementation) to optimize the chances of such interventions to become sustainable.
- The “public goods” argument is valid but not for all SMTQ services and not under all circumstances. In the case of Sri Lanka, UNIDO capacity building at the public laboratories has led to a more competitive market for testing services with positive effects on the prices and quality of services. Private laboratories (both in-house and

service providers) benefited indirectly. Future interventions should explore ways of further increasing the benefits for private laboratories while watching very closely the thin borderline between making markets for SMTQ services work but not distorting them.

- SMTQ projects can make significant contributions to poverty reduction provided such impact is dealt with as a priority during the design and implementation of the project. The target groups for expected poverty impact should be clearly defined; sub-sectors with a strong “trade poverty nexus” should be given priority and potential “impact drivers” should be identified, pursued and monitored throughout implementation.

Methodological lessons

- This impact evaluation generated considerable learning effects and has been one of the pillars of the thematic evaluation of UNIDO SMTQ activities. The explanatory power of the “theory based” evaluation approach has been demonstrated for the specific case of SMTQ capacity building projects. The approach should be further pursued and refined under future UNIDO evaluations.

Annex 1: Evaluation terms of reference



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

TERMS OF REFERENCE

Independent Evaluation of UNIDO Projects in Sri Lanka in the area of “Standards, Metrology, Testing and Quality”

I. BACKGROUND

In March 2008 the UNIDO Executive Board mandated the UNIDO Evaluation Group (EVA) to carry out an independent thematic evaluation of UNIDO projects and initiatives in the area of Standards, Metrology, Testing and Quality (SMTQ). The thematic evaluation is to be carried out during the 2008/2009 biennium and in close cooperation with the UNIDO “Trade Capacity Building” (TCB) branch.

As part of this thematic evaluation Sri Lanka has been selected for an in-depth impact evaluation because UNIDO has been providing SMTQ related Technical Assistance (TA) to Sri Lanka since the late 1980s. The impact evaluation will cover the following eight UNIDO SMTQ projects related to SMTQ, which have been implemented between 1998 and 2008 and with an overall budget of more than 3.3 million USD. The bulk of this amount has been funded by NORAD.

	Project Title	Budget (USD)	Donor
TF/SRL/99/003	STRENGTHENING CAPACITY IN QUALITY, STANDARDIZATION AND TESTING IN SRI LANKA	704,938	Norway
XP/SRL/99/049	INTEGRATED INDUSTRIAL DEVELOPMENT SUPPORT PROGRAMME (QUALITY)	127,052	Regular Programme of TC projects (seed money)
UB/SRL/00/001	SUPPORT TO QUALITY, STANDARDIZATION AND METROLOGY (NORAD COST SHARING)	205,106	Unutilized balance
TF/SRL/01/002	TRADE FACILITATION SUPPORT FOR SRI LANKA THROUGH THE DEVELOPMENT OF TESTING LABORATORIES RELATED TO INDUSTRIAL METROLOGY, RUBBER/PLASTIC AND TEXTILE/APPAREL	1,217,779	Norway
US/SRL/01/108	SUPPORT IN LABORATORY ACCREDITATION, SRI LANKA	320,709	Republic of Korea

US/SRL/04/059	TRADE FACILATION SUPPORT FOR SRI LANKA THROUGH THE DEVELOPMENT OF TESTING LABORATORIES FOR THE FOOD PROCESSING, CERAMIC AND COIR INDUSTRIES	176,991	UK IP funds
TF/SRL/06/001	PREPARATORY ASSISTANCE FOR THE EU TRADE RELATED TECHNICAL ASSISTANCE (TRTA) PROJECT IN SRI LANKA	57,001	Trust Fund Trade
TE/SRL/06/004	STRENGTHENING INTERNATIONAL CERTIFICATION CAPACITY IN SRI LANKA WITH PARTICULAR REFERENCE TO SOCIAL ACCOUNTABILITY STANDARD (SA 8000) AND FOOD SAFETY (HACCP/ISO 22000) STANDARD	504,867	Norway
Total		3.314.443	

The main counterparts of the UNIDO projects were: the Industrial Technology Institute (ITI); the Sri Lanka Standards Institutes (SLSI); the Textile Training & Services Centre (TTSC) and, more recently, the Chambers of Commerce and Industry. Together with these partners UNIDO intervened primarily in the following SMTQ-related areas:

- upgrading and accreditation of laboratories against ISO 17025 (chemical testing, microbiology and plastic/rubber labs at ITI; chemical and microbiology labs at SLSI; textile testing lab at TTSC);
- establishing the industrial metrology lab at ITI and building the capacity of the Metrology and Instrumentation Division of the ITI;
- developing environmental management through establishing ITI as a local ISO 14000 certification body, training of 20 local consultants as ISO 14000 auditors and certification of 5 pilot companies;
- strengthening international certification capability with particular reference to social accountability (SA 8000) and food safety (HACCP and ISO 22000).

II. PURPOSE OF THE EVALUATION

The impact evaluation of the UNIDO SMTQ projects in Sri Lanka will be a cornerstone of the wider thematic evaluation of UNIDO SMTQ projects and initiatives expected to cover SMTQ projects in more than 20 countries. It is of strategic importance for the thematic evaluation because it will allow, thanks to the continuous presence and involvement of UNIDO in Sri Lanka, to adopt a relatively long-term perspective on the evolution of the UNIDO approaches to SMTQ-related TA and, most importantly, to assess the longer term effects and impact of UNIDO interventions on Sri Lankan trade, industrial development and economic growth.

III. METHODOLOGY

This independent evaluation shall be conducted in compliance with the UNIDO evaluation policy.⁸ It shall determine, as systematically and objectively as possible, the individual and

⁸ Available from www.unido.org

combined relevance, effectiveness, impact and sustainability of the eight UNIDO projects concerned.

The evaluation will concentrate on identifying achieved results and to what extent these led to developmental or long term effects. These will be assessed against the objectives and expected outcomes laid down in the respective project documents, including the re-examination of the relevance of the objectives and of the project design. The evaluation shall also address efficiency aspects such as management mechanisms applied (in particular planning, monitoring, field coordination and self-evaluation) although the evaluation of efficiency would not be at the core of the exercise and only covered for those aspects with a strong learning potential for UNIDO.

The evaluation will apply the basic principle of “realistic evaluation”: “*Intervention + Environment = Impact*”.⁹ This means that the evaluation must take into account factors external to the UNIDO projects that may have facilitated or impeded the achievement of impact. To this end, the evaluation will have to have a closer look at Sri Lanka’s trade related policies, its National Quality System (NQS) and initiatives of the Government, other donors and the private sector in fostering SMTQ. An effort will be made to attribute changes to UNIDO versus other actors.

Diagram 1 presents a stylized view of the mechanisms by which a NQS is supposed to interact with the national economy, its inputs and outputs and how it is supposed to create impact. A NQS consists of five main components: standardization; metrology; testing; certification of products and processes; accreditation. Depending on the component the mix of public and private players and the distribution of tasks between them can be different. An efficient interaction between public and private bodies determines the NQS’s effectiveness and efficiency. The NQS receives inputs (human, technical and financial resources; technical assistance; political support; etc) with the expectation that it should produce outputs (services) for private and public sector users. The use of these outputs, in turn, is then expected to produce impact of different forms, such as export and GDP growth; innovation through knowledge and technology flows and improved environmental, sanitary and social conditions. Assessing and, if possible, measuring this impact is at the centre of interest of the present evaluation.

As for any other impact evaluation the question will arise whether, to what extent and how this impact can be attributed to UNIDO interventions. Although it is widely recognized that it is often more realistic to identify *con*-tribution rather than *at*-tribution of impact to input it will be part of the evaluation exercise to demonstrate the plausibility of assumed causal chains from input to impact and to differentiate, as far as possible, UNIDO interventions from other interventions.¹⁰ At the present state of knowledge it is not clear, whether there are non-beneficiary companies that could be used as control groups.

It will be crucial to define proper metrics (indicators and sources for verification) for the six dimensions of the NQS shown in diagram 1: NQS inputs; NQS description; NQS outputs; performance of industrial NQS users; performance of non-users and finally defining appropriate impact metrics.

⁹ Pawson, Ray and Tilley, Nick; Realistic evaluation; 1997

¹⁰ It seems that, in the case of Sri Lanka, UNIDO has delivered the bulk of SMTQ related TA, which would facilitate attribution.

The evaluation shall be carried out through analyses of various sources of information including desk analysis, observation at the project sites, surveys and interviews with counterparts, beneficiaries, partner agencies, donor representatives, project staff and through the cross-validation of data. In keeping with the UNIDO evaluation policy and while maintaining independence, the evaluation will be carried out based on a participatory approach, which will seek the views and assessments of all parties.

In the case of this evaluation, a strong participatory approach is particularly required for two reasons: mobilizing the necessary country know-how and conducting in-depth surveys among the industrial users of SMTQ services in Sri Lanka. Both requirements can only be met by conducting the evaluation in close partnership with a competent research institute in Sri Lanka.

SMTQ projects aim at building, improving or consolidating the “National Quality System” (NQS) of developing countries. In this sense they come under the “comply” heading of UNIDO thematic priority of *Trade Capacity Building (TCB)* that is structured under three headings:

- Compete – Developing competitive manufacturing capability
- Comply – Developing and promoting conformity with market requirements
- Connect – Enhancing connectivity to markets

Although focusing on the “comply” area, SMTQ projects cannot be evaluated without taking into account the “compete” and “connect” aspects. The relevance of a SMTQ project critically depends on the existence and active involvement of competitive companies, which are connected to export markets and which use a variety of services produced by the NQS.

This means that the wider “compete” and “connect” aspects cannot be ignored. In fact, impact can only be achieved as a result of a wide range and inter-connected efforts. The evaluation shall therefore adopt a systemic evaluation approach analyzing the availability of critical functions of the NQS on which the relevance and effectiveness of the project critically depends, although these functions and contributions may be external to the project.

In the case of Sri Lanka, as in many other countries, the “compete” and “connect” aspects have been tackled under UNIDO “Integrated Programs” (IP). The latest evaluation of the IP Sri Lanka carried out in 2003 will therefore be one of the reference points for this impact evaluation.

This impact evaluation will be methodologically challenging but also timely for UNIDO as a whole and for the UNIDO Evaluation Group in particular. While it should be recognized that UNIDO does not yet have extensive practical experience with impact evaluations, the UNIDO Executive Board has requested the UNIDO Evaluation Group to develop a systematic approach and methodology for impact evaluations that should be adapted to the specific TA delivery modes of UNIDO.

Impact evaluation is one of the priorities under UNIDO 2008/2009 plan for the further organization wide implementation of Results Based Management (RBM). A solid foundation for developing UNIDO impact evaluation methodology has been

laid by a study on “*DEVELOPING A METHODOLOGY FOR IMPACT EVALUATION AT UNIDO: POSSIBLE ROUTES AND OPTIONS*”. The findings and recommendations of this study will be used as a methodological guidance for this evaluation.

Furthermore, the limited practical experience of UNIDO with conducting impact evaluations shall be off-set through the involvement of a highly experienced evaluator specializing in impact evaluation who will provide state-of-the-art methodologies and ensure methodological rigor.

Last but not least, the evaluation shall take into account the conceptual framework that will be developed as part of the thematic evaluation. The main purpose of the conceptual framework is to ensure comparability of the analysis, findings and recommendations across the different projects, covered by the thematic evaluation.

The methodological pillars of the evaluation can be summarized as follows:

- Focus on impact evaluation;
- Context based systemic evaluation approach;
- Partnership with a national research institute;
- Involvement of an impact evaluation specialist;
- Comparability with other evaluations under the thematic evaluation.

IV. EVALUATION ISSUES

The impact evaluation of UNIDO SMTQ projects in Sri Lanka should cover the following issues:¹¹

1. Country needs analysis: Which trade flows (export; import; internal) depend critically on SMTQ and on which aspect of it? Which public goods (health; environment; consumer protection; working conditions; etc) depend critically on which aspect of SMTQ? Are there significant bottlenecks to socio-economic development that can be causally linked to deficiencies of the NQS in Sri Lanka? Can these drawbacks in socio-economic development be quantified? How did this situation develop over time (1998 to 2008)?
2. Supply side analysis: How did the NQS of Sri Lanka develop between 1998 and 2008? What are its characteristics, strengths and weaknesses to date (also compared to similar countries)? How did government policy priorities related to SMTQ develop? Are private sector priorities adequately taken into account? Do public and private players develop their SMTQ services synergetically?
3. Demand analysis: How did the services and other outputs of the NQS of Sri Lanka develop between 1998 and 2008? How well does the NQS satisfy the needs of industrial users? Which types of industrial users are well served and

¹¹ N.B.: All questions refer to the NQS as a whole, including public and private players.

which less well? What are the outputs/services delivered to the public sector?
How well are the needs of the public sector covered?

4. Industrial outcome: In what respect and to what extent did industrial users of NQS services and outputs improve their performances?
5. Outcome of public goods: In what respect and to what extent did providers of public goods improve their performances due to the use of NQS services and outputs?
6. Input into the NQS: How has the input into the NQS of Sri Lanka developed between 1998 and 2008 in terms of resources; investment; technical assistance and policy priorities?
7. UNIDO contribution: What has been the UNIDO contribution to developing the NQS of Sri Lanka? Was it relevant, significant, effective, efficient and well coordinated? What has been the contribution during the project and has it been up-scaled after the end of the project through demonstration and dissemination? Did the UNIDO intervention lead to sustainable structures and the achievement of impact-oriented objectives?
8. Economic impact: Can significant (positive or negative) impact on export, import and internal trade of manufactured goods and on GDP growth be expected from SMTQ development? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?
9. Impact on innovation: Can significant (positive or negative) impact on innovation, knowledge and technology transfer be expected from SMTQ development? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?
10. Environmental impact: Can significant (positive or negative) environmental changes/impact be expected from SMTQ development? How significant is this impact as compared to overall environmental challenges? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?
11. Impact on public health: Can significant (positive or negative) impact on public health be expected from SMTQ development? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?
12. Impact on working conditions: Can significant (positive or negative) impact on industrial working conditions be expected from SMTQ development? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?

13. Impact on poverty: Can significant (positive or negative) impact on poverty be expected from SMTQ development? What are the poverty dimensions¹² concerned (economic; socio-cultural; political; protective; human)? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?
14. Impact on gender: Can significant (positive or negative) impact on gender be expected from SMTQ development? To what extent can such impact be demonstrated? To what extent can this impact be attributed to UNIDO interventions?
15. Recommendations: Which recommendations can be made to the government of Sri Lanka for the further development of the NQS in Sri Lanka? Which recommendations can be made to UNIDO for the more impact-oriented ongoing or forthcoming UNIDO projects in Sri Lanka? Which recommendations can be made to NORAD?
16. Lessons learned: Which lessons of wider applicability can be drawn from the Sri Lanka experience that would allow UNIDO to further enhance impact of its SMTQ related projects and programmes.
17. Country specificities: Can the Sri Lanka experience be extrapolated to other countries? Can critical country specific success factors be specified that should be given priority when designing SMTQ interventions?

V. THE EVALUATION TEAM

The evaluation will be carried out by an independent international evaluation consultant specializing in impact evaluation (team leader), an independent international evaluation consultant specializing in SMTQ and a team of researchers from a specialized research institute in Sri Lanka. None of the evaluators will have been involved in the design and/or implementation of any of the covered projects.

The UNIDO Evaluation Group will manage the evaluation and be responsible for the quality control of the evaluation process and of the report. A member of the UNIDO evaluation group will participate as a member of the evaluation mission. This person will be responsible for the coordination with the overarching thematic evaluation, provide inputs regarding findings, lessons learned and recommendations from other UNIDO evaluations and ensure the uptake of methodological impact evaluation experience by the UNIDO Evaluation Group. The national expert who has been contracted by UNIDO for the supervision of SMTQ projects in the past will provide logistical and technical support to the evaluation team.

¹² DAC Guidelines; Promoting Pro-Poor Growth; Policy Guidance for Donors; OECD, 2007

VI. MAIN TASKS, DELIVERABLES AND DELIVERY DATES

Tasks	Deliverables	Delivery dates
Screening available documentation	Annotated bibliography and extraction of key information from available documents	09/2008
Identification and selection of sub-contractors	<ul style="list-style-type: none"> ▪ sub-contract with partner institute in Sri Lanka ▪ sub-contracting of impact evaluation specialist ▪ sub-contract of SMTQ evaluation specialist 	09/2008
Elaboration of methodology and detailed work plan including planning of surveys among beneficiaries and control groups;	Methodology and detailed workplan; sampling and questionnaires for surveys	11/2008
Research on the National Quality System in Sri Lanka (characteristics; inputs; outputs) and its interaction with the national economy (use of NQS outputs; impact)	Report	03/2009
Execution of surveys among beneficiaries including, to the extent possible, control groups of non-beneficiaries	Report	03/2009
Preparation of field work	Programme and interview guidelines	03/2009
Evaluation mission to Sri Lanka	Draft report	04/2009
Presentation of preliminary results; collection of feed-back and integration into final report	Final report	05/2009

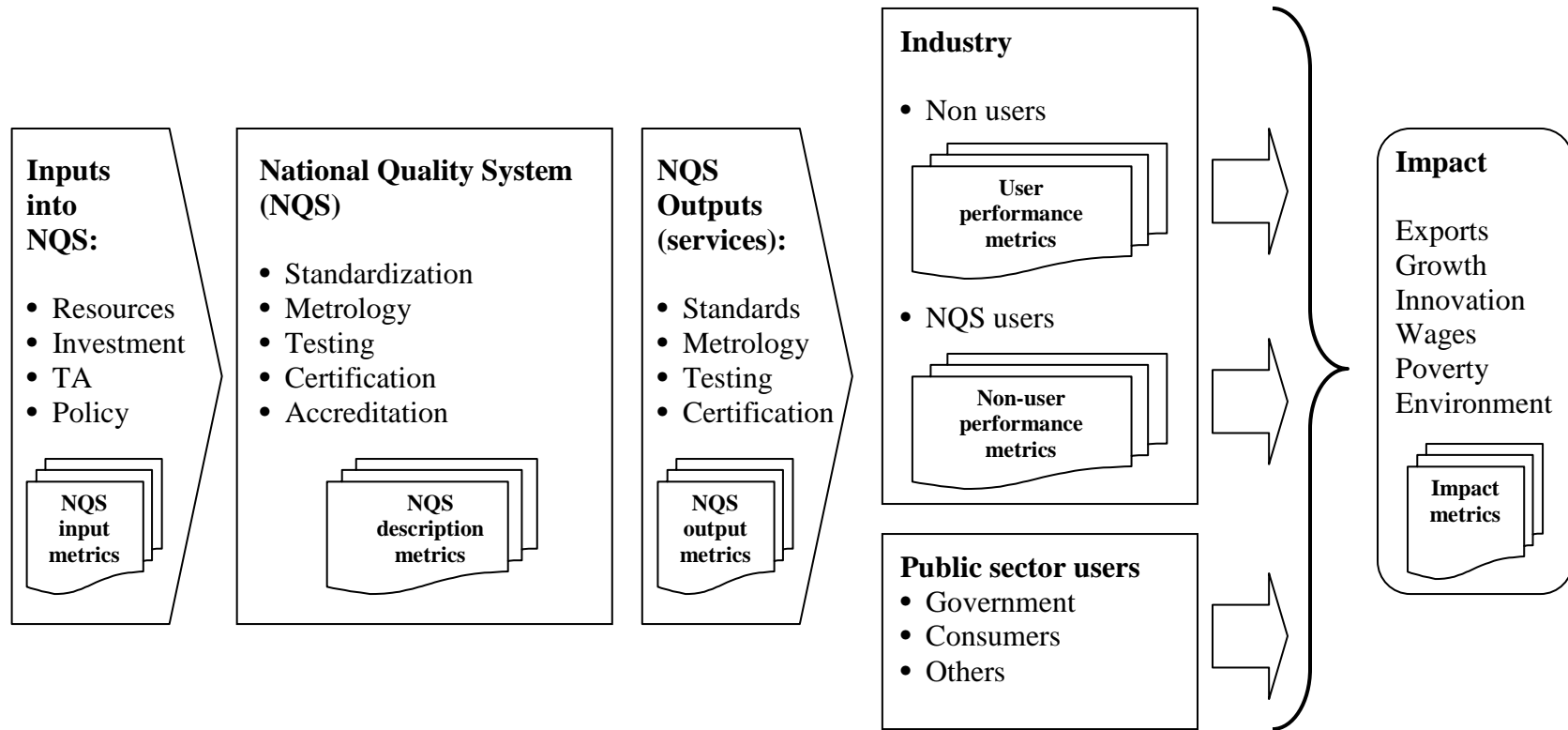
VII. REPORTING

To discuss and validate its preliminary findings the evaluation team will organize meetings with the key stakeholders in the field and meet with UNIDO staff at HQ. It will prepare and present its draft report to UNIDO and the donor. The evaluation report will follow the structure given in Annex 2. The reporting language will be English.

Review of the Draft Report: The draft report will be shared with the Project Managers and the project staff for initial review and consultation. They may provide feedback on any errors of fact and may highlight the significance of such errors in any conclusions. The consultation will also seek agreement on the findings and recommendations. The evaluators will take the comments into consideration when preparing the final draft of the report, which UNIDO will share with the government of Sri Lanka and the donor. The final version of the evaluation report will be submitted 2 weeks after the submission of comments by the UNIDO Evaluation Group.

Quality Assessment of the Evaluation Report: All UNIDO evaluations are subject to quality assessments by the UNIDO Evaluation Group. The quality of the evaluation report will be assessed and rated against the criteria set forth in the Checklist on evaluation report quality in Annex 3.

National Quality System: Stylized causal chain from input to impact



Annex 2: Main project outputs

Outputs at SLSI

Equipment

Based on a capacity needs assessment a computer network server, computers, a printer, scanner, photocopier and a duplicator required for a modern Management Information System (MIS) were purchased and installed

The equipment received was of approximate value USD 35,000

Staff Training

Laboratory staff were trained by international consultants (Annex 7) on the following:

Development of quality manuals, procedure manuals, test method manuals and usage of control charts and media quality control for microbiological analysis

Implementation of the laboratory QMS in conformity to the ISO 17025 standard

3 officers undertook a study tour through which an overview of laboratory accreditation was obtained

The staff received advisory support from international consultants for corporate planning and MIS development

Management System

The MIS was upgraded (particularly to improve test record keeping) subsequent to establishing a Local Area Network (LAN)

A centralized system (DOCSERVER) was established to facilitate sharing of information and resources amongst the different divisions of the Institute.

Credibility (Accreditation)

Quality manuals were developed for the implementation of the QMS in the chemical and microbiological laboratories to meet the requirements for accreditation to ISO 17025.

The chemical testing laboratory was accredited to ISO 17025 by SWEDAC for specific parameters in fertilizer and water in 2002

The microbiological testing laboratory was accredited to ISO 17025 by SWEDAC for specific parameters in water, food and beverages in 2002. An extended scope was accredited in 2006

Financial support for accreditation fees to SWEDAC and costs of SWEDAC assessors were received for the chemical and microbiological laboratories for 2002, 2003 and 2004

Financial support was received for participation in recognized proficiency testing programmes organized by international agencies till 2004.

Credibility (Certification)

Staff of the Quality Systems Certification division was trained to implement the QMS required for accreditation to ISO Guide 62 “General requirements for bodies operating assessment and certification/registration of quality systems”¹³.

16 officers were trained by lead auditors from RWTÜV on the ISO 14001, ISO EMS auditor scheme. This included a lead auditor training and a practical audit course. The auditors also obtained practical training so that they can register as lead auditors

Outputs at ITI

Equipment

Based on a capacity needs assessment laboratory equipment was procured for carrying out testing within the identified scope and installed and commissioned in the chemical and microbiological laboratories.

Based on a capacity needs assessment laboratory equipment was procured for carrying out mass and temperature calibrations and installed and commissioned in the metrology laboratory.

Laboratory equipment was procured for upgrading facilities for carrying out dimensional, electrical, pressure and volumetric and installed and commissioned in the metrology laboratory.

Accessories and spares were obtained for the equipment installed in the chemical testing laboratory.

Laboratory equipment required to upgrade the food testing laboratory was procured installed and commissioned for carrying out testing within the identified scope.

Laboratory equipment and ISO standards required to upgrade the rubber testing laboratory was procured, installed and commissioned for carrying out testing within the identified scope.

A sophisticated central environmental control system to achieve the required temperature and humidity conditions acceptable to international levels in the mass, electrical pressure volumetric, temperature and dimensional laboratories was purchased and installed in the metrology laboratory

Computer accessories and peripherals and a multimedia projector required for promotional activities were received

The equipment received was of approximate value USD 1.5Mn and the central environmental control system purchased locally was of approximate value LKR 10Mn

Staff Training

Laboratory staff were trained by national and International consultants (Annex 7) on the following:

- Development of quality manuals, procedure manuals, test method manuals and usage of control charts and media quality control for microbiological analysis
- Calibration procedures and uncertainty calculations in calibration methods

¹³ SLSI was subsequently accredited to ISO Guide 62. by RvA, the Dutch Accreditation Council, the accreditation body, independently of the UNIDO intervention

- Implementation of the QMS in conformity to the ISO/IEC 17025 for international accreditation

In the area of chemical and microbiological analysis 5 officers received training

In the area of food analysis 3 officers received training

In the area of metrology 8 officers received training and 2 officers undertook a study tour (Annex 8)

In the area of rubber testing 5 officers received training and 1 officer undertook a study tour (Annex 8)

1 officer received training in Financial Management

A national consultant provided guidance to the staff for enhancing the service capabilities of the accredited laboratories to ensure that the facilities that were strengthened are utilized to the maximum, enable the laboratories to maintain financial stability through adequate fund management, enhance corporate governance and develop procedures for a viable performance based incentive scheme to ensure staff commitment.

Management System

The service capability of the institute was enhanced by implementation of the following:

- Costing and cost control systems and pricing policies
- Budget decentralization and monitoring and controlling group budgets
- Procedures for approval of research projects/training and capital expedition
- Systems and procedures for support service groups
- Restructuring plan for institute
- Performance based incentive scheme

A Management Information System (MIS) was received for the Metrology Laboratory for client related activities, generation of calibration certificates and all types of management reports

Credibility (Accreditation)

Quality manuals were developed for the implementation of the QMS in the chemical and microbiological laboratories to meet the requirements for accreditation to ISO 17025.

The chemical testing laboratory was accredited to ISO 17025 by SWEDAC for specific parameters in water, waste water including heavy metals and pesticide residues in 2002

The microbiological testing laboratory was accredited to ISO 17025 by SWEDAC for specific parameters in water, waste water, fish and shrimp in 2002

The food testing laboratory was accredited to ISO 17025 by SWEDAC for specific parameters in fish, seafood and vitamins in 2007

The metrology laboratory was accredited to ISO 17025 by SWEDAC for temperature and mass calibrations in 2004 and dimension, volumetric and electrical in 2007.

The rubber laboratory was accredited to ISO 17025 by SWEDAC for specific parameters in rubber and rubber based products in 2007.

Financial support (for accreditation fees to SWEDAC and costs of SWEDAC assessors) were received for the chemical and microbiological laboratories in 2002, 2003 and 2004

Financial support (for accreditation fees to SWEDAC and costs of SWEDAC assessors) were received for the metrology laboratory in 2004 and 2006

Financial support (for accreditation fees to SWEDAC and costs of SWEDAC assessors) were received for the rubber laboratory in 2006

Financial support was received for participation in recognized proficiency testing programmes organized by international agencies till 2004 for chemical and microbiological laboratories and till 2006 for food and rubber testing laboratories.

Financial support was received for procurement of ATCC cultures for the microbiological laboratory, ISO standards for the rubber laboratory and quality control material for the food laboratory.

3 promotional videos on 'Metrology for industrial development' targeted for industry and exporters, 'Marketing globally' targeted at International development agencies, the GOSL and donor agencies and 'Introduction to metrology and calibration' for Universities and schools were produced and made available

Credibility (Certification)

4 officers were trained by lead auditors from RWTÜV on the ISO 14001, ISO EMS auditor scheme. This included a lead auditor training and a practical audit course. The auditors also obtained practical training so that they can register as lead auditors

4 officers were provided training for the provision of consultancy services to implement the QMS necessary for certification to ISO 14001

Outputs at TTSC

Equipment

Laboratory equipment based on a capacity needs assessment for carrying out testing within the identified scope was procured for the Textile testing laboratory.

Equipment required for in house calibration activities were identified and procured.

The equipment received was of approximate value USD 5,000

Staff Training

Laboratory staff were trained by National and International consultants (Annex 7) on the following:

Development of quality manuals, procedure manuals, test method manuals and usage of control charts and inter-laboratory correlation methods.

Implementation of the QMS in conformity to the ISO/IEC 17025:2005 standard

Use of metrological facilities for in house calibration of measuring equipment and estimation of uncertainty.

Operation and maintenance of measuring equipment

Implementation of an appropriate communication system within the laboratory to maintain ISO 17025 QMS

Management System

No outputs with respect to Management systems.

Credibility (Accreditation)

Quality manuals were developed for the implementation of the QMS in the laboratory to meet the requirements for accreditation to ISO 17025.

The laboratory was accredited to ISO 17025 by SWEDAC for 14 parameters in fabric in 2002.

Financial support for SWEDAC assessors and accreditation fees to SWEDAC for the period 2002/2003 was received

Nature of investment	SLSI (USD)	ITI (USD)	TTSC (USD)
International consultants	70,000	154,454	-
Sub-contract	50,000	309,364	15,000
Training & Study tours	7,065	186,072	-
Equipment	37,065	1,543,482	5,000
Total	164,130	2,193,372	20,000

(Adopted from figures received from National Project Co-ordinator, UNIDO Focal Point)

Note:

In the figures that were received a total subcontract figure of 374,364 USD was allocated to the ITI. On a second look at this figure, it seems too high for ITI. On an assumption that this figure comprise of fees paid to national experts, SWEDAC accreditation fees, MIS (only for ITI), support for proficiency testing, procurement of cultures, standards, quality control material, and production of promotional material (ITI only) an assumed allocation of 50,000USD has been made to SLSI and a total of 15,000USD to TTSC. These figures were arrived at taking into consideration the SWEDAC accreditation fees for ITI laboratories, the number of years for which accreditation was supported, assistance provided for national experts, proficiency testing etc.

Annex 3: Checklist of “sustainability assumptions”

1. Equipment:
 - 1.1. Appropriate laboratory infrastructure (air conditioning, uninterrupted electricity)
 - 1.2. Availability of budget for maintaining climate controlled Metrology laboratories
 - 1.3. Availability of necessary chemicals and standards for optimum usage
 - 1.4. Availability of repair and maintenance service (maintenance budget; spare parts; manufacturer of equipment represented in the country; in-house is preferable)
 - 1.5. Forward budget for purchase of new equipment (in 5 to 10 years)

2. Staff:
 - 2.1. Staff with appropriate skills level is available and sufficient training opportunities and funds for staff development exist (what about professional associations – doesn't the Sri Lanka laboratory association offer opportunities for staff mobility and training that could be relevant?)
 - 2.2. Appropriate remuneration package (as public service salary package is usually low, allowances as fitting to be built in for staff retention and motivation)
 - 2.3. Formalized annual increment and promotional schemes to encourage performers;
 - 2.4. An operational Performance based incentive scheme to ensure staff commitment
 - 2.5. Suitable succession plan in place to ensure that work is unhindered due to possible movement of trained and qualified staff

3. Management/governance:
 - 3.1. Laboratory Managers have suitable knowledge and experience to maintain the Quality system as per requirements of ISO/IEC 17025
 - 3.2. Quality concept leveraged across entire organization (a separate Quality Assurance Department is a catalytic factor)
 - 3.3. Laboratories operating as independent units with business oriented devolved budgets (income/expenditure) and as profit centres (Financial sustainability)
 - 3.4. Costing methods and pricing strategy in place for services whilst being competitive
 - 3.5. Dependence on income from mandatory requirements imposed by Government (eg. testing of uniform material supplied to government institutions from local textile manufacturers is presently mandatory and brings in 50 per cent of Income of TTSC)
 - 3.6. Laboratories able to meet changing demands of market place (enhanced business)
 - 3.7. A strategic orientation of the organization towards client needs

4. Accreditation:
 - 4.1. Scope of accreditation and scope expansion directly related to needs of country
 - 4.2. Budget for annual renewal of accreditation status with internationally recognized accreditation body with MRA (Institute commitment is required to bear at least a part of the fees with the other part being possibly borne by the laboratory itself)
 - 4.3. Budget for other recurring expenses that are mandatory for maintaining accreditation status (eg. proficiency testing, standards, metrology traceability)
 - 4.4. Budget for staff training for scope expansion

The assumptions above were used as a check list as follows:

1. **Met** - All assumptions marked as "Met" demonstrate that the organization has fulfilled an assumed sustainability need.
2. **Needs work** - An assumption that is marked as "Needs Work" implies that work has been done towards achieving this assumption. The organization is aware of the need and is working towards attaining it.
3. **Not addressed** – Can mean a) assumption is not applicable to the management operations of the organization b) the organization is not sure of the need to meet this assumption and c) the organization has not met, nor is working on this assumption presently, but may address it in the future (whether it is a), b) or c) needs to be spelled out clearly) OK

Annex 4: Status of public and private testing laboratories

Public Sector Testing Laboratories

Laboratory	Scope of testing	QMS	Comments
SLSI	Chemical & microbiological analysis of food, water, fertilizer, oils & fats etc.	ISO 17025	SWEDAC (2002) & SLAB (2007) accredited for selected parameters
	Material, electrical & textile		Not accredited
ITI	Chemical & microbiological analysis of food, spices, water, waste water, fertilizer, oils & fats etc.	ISO 17025	SWEDAC (2002) & SLAB (2006) accredited for selected parameters
	Residue analysis		SWEDAC (2002) & SLAB (2006) accredited for pesticide residues, trace metals and Histamine (2006)
	Material		SWEDAC (2006) & SLAB (2006) accredited for rubber product testing & ceramic & porcelain ware (SLAB 2007)
TTSC	Textile (fabric)	ISO 17025	SWEDAC (2002) NABL (2005) accredited
Atomic Energy Authority	Nuclear analytical testing	ISO 17025	SLAB (2006) accredited
	Elemental analysis by XRF		Not accredited
Government analyst	Food, forensic & toxicological analysis	QMS not established	Not accredited
Medical Research Institute	Microbiological analysis of food, water & other clinical analysis	QMS not established	Not accredited
Department of Health services (NHSI)	Chemical & microbiological analysis of food & water	QMS not established	Not accredited
Drug Quality Assurance	Analysis of drugs	QMS not established	Not accredited
City Analyst	Chemical & microbiological analysis of food & water	QMS not established	Not accredited
NARA	Chemical & microbiological analysis of fish & water	ISO 17025	SLAB accredited for microbiological analysis only (2006)
	Residue analysis (Histamine, trace metals)		Not accredited
Veterinary Research Institute	Chemical analysis of animal feeds, microbiological analysis & clinical analysis	QMS being implemented	Not accredited
Faculty of Veterinary Science	Antibiotic residue analysis of fish	QMS being implemented	Not accredited

Private Sector testing laboratories

Laboratory	Products tested	QMS	Comments
SGS	Food, spices, water, tea, fertilizer, edible oils, garments, textiles, petroleum products.etc.	ISO 17025	NABL (2005) and SLAB (2007) accredited for selected parameters (chemical & microbiological & residue analysis). Affiliate of the SGS global network
Bamber & Bruce	Food, spices, water, fertilizer, edible oils etc.	ISO 17025	SLAB (2008) accredited for selected parameters (chemical & microbiological & residue analysis)
Lindel	Water & waste water	ISO 17025	SLAB (2008) accredited for selected parameters (chemical analysis)
Microchem	Food & water	ISO 17025	SLAB (2009) accredited for selected parameters (chemical & microbiological analysis)
Intertek	Spices, water, tea, edible oils, coir, ceramics, desiccated coconut, feedstocks etc.	Sri Lanka location of a global network offering testing, inspection and consulting services	
BVCPS	Textiles & accessories	Sri Lanka location of a global network offering a range of services of which one is testing and analysis	

LACE accredited textile laboratories

Sri Lanka In-house Laboratories	Brand Owners and buyers							
	BHS	Ethel Austin	Home-base	Adams	Boden	Matalan	TU Childrens-wear	Tesco
TTSC	√	√	√	√	√	√	√	
BVCPS	√	√	√	√	√	√	√	
SGS	Not accredited							
Hayleys	√			√	√			√
Hela clothing	√						√	√
Ocean Lanka	√		√	√				√
Slimline	√							√
Stretchline	√							√
Textured Jersey	√							√

Annex 5: International outreach

Year	Country	Organization	Trainees	No.	Scope of Training	Outcome
Training						
2005	Pakistan	Pakistan Standards & Quality Control Authority (PSQCA), Karachi	Director, Deputy Director and Examiner	3	Laboratory quality management with special reference to microbiological analysis of water and fish.	Accredited by NA
2005	Pakistan	Marine Fisheries Department (MFD), Karachi	Laboratory personnel	2		Accredited by NA
		Pakistan Council for Scientific & Industrial Research (PCSIR), Karachi		2		
		PCSIR, Lahore		1		
2005	Cambodia	Department of Metrology (DOM), Phnom Penh	Laboratory personnel	3	Industrial Metrology and Management of Metrology Laboratory	Preparing for Accreditation
2005	Laos PDR	Department of Intellectual Property, Standards and Metrology (STEA), Vientiane		2		
2006	Pakistan	National Agricultural Research Centre (NARC), Islamabad	Laboratory personnel	2	Laboratory quality management with special reference to microbiological analysis of water and fish.	Accredited by NA
		National Water Quality Laboratory (NWQL), Islamabad		2		
		Pakistan Council for Scientific & Industrial Research (PCSIR), Lahore		1		
2006	Vietnam	Directorate for Standards & Quality, Quality Assurance & Testing (QUATEST), Ho Chi Ming City	Laboratory personnel	2		Accredited by NA (ASEAN microbiology reference laboratory)
		National Fisheries Quality Assurance & Veterinary Directorate (NAFIQAVED), Ha Noi City		1		Accredited by NA
2007	Pakistan	Pakistan Standards & Quality Control	Laboratory personnel	2		Accredited by NA

Year	Country	Organization	Trainees	No.	Scope of Training	Outcome
Training						
		Authority (PSQCA), Karachi				
2009	Ghana	Food & Drugs Board and Ghana Standards Board (GSB)	Laboratory personnel	04	Laboratory QMS and microbiological analysis of water and food	GSB accredited by DACH
2009	Bangladesh	Bangladesh Standards & Testing Institute	Director and Metrologists	04	Laboratory QMS & maintaining traceability	Preparing for Accreditation
Consultancy						
2005	Vietnam	S. A. Silva & Sons, Ben Tre	Laboratory personnel		Quality assurance in microbiological analysis	Successful inter-comparison study with importing company (Mars, UK)
2007	Pakistan	Marine Fisheries Department (MFD), Karachi	Laboratory personnel		Laboratory QMS & histamine analysis	Accredited by NA
2009	Bangladesh	Department of Fisheries	Laboratory personnel and UNIDO Project co-coordinator		Meeting EU requirements for fishery exports	Preparing for Accreditation
On – site Calibration services						
Year	Country	Organization			Equipment calibrated	Outcome
2008	Maldives	Food and Drug Authority			Ovens, incubators, autoclaves, balances, water baths and refrigerators.	Fulfillment of requirement for upgrading to international status as per ISO/IEC 17025
2008	Pakistan	Qarshi Research International (Pvt) Ltd			Precision balances	
2009	Pakistan	PCSIR (Lahore & Karachi), PSGCA (Karachi), Leather Research Centre (Karachi), Grain Quality Testing Laboratory (Karachi & Islamabad), Marine Fisheries Department (Karachi), Leather product & Development Institute (Sialkot) & National Technical University (Faisalabad)			Balances	Maintenance of traceability

Annex 6: Survey of prices for testing services

1. CHEMICAL & MICROBIOLOGY

Test	Lab 1 ITI Sri Lanka	Lab 2 Sri Lanka	Lab 3 India	Lab 4 India	Lab 5 Malaysia	Lab 6 Singapore	Lab 7 Singapore
	USD (LKR)	USD (LKR)	USD	USD	USD (MYR)	USD	USD (SGD)
Melamine in milk powder/milk based products	174 (20,000)	130 (15,000)	130	250	241 (850)	300	205 (300)
Sudan colours in spices and related products	35 (4,000)	48 (5,500)	50	-	170 (600)	200	164 (240)
Histamine in Fish	30 (3,500)	36 (4,140)	30	-	71 (250)	65	55 (80)
E.coli and Coliform count in Drinking water	20 (2,300)	17 (1,900)	24	-	28 (100)	40	27 (40)
Vitamin A in Food	35 (4,000)	53 (6,050)	60	-	51 (180)	135	123 (180)
Vitamin E in Food	35 (4,000) (both) 61 (7,000)			-	51 (180)	200	164 (240)
Other	12per cent VAT	12per cent VAT	-	-	-	-	7per cent GST

All Labs have been granted internationally recognized Accreditation

2. CALIBRATION

Equipment	Lab 1 ITI, Sri Lanka	Lab 2 Sri Lanka	Lab 3 Malaysia	Lab 4 Singapore	Lab 5 Hong Kong
	USD (LKR)	USD (LKR)	USD	USD (SGD)	USD (HKD)
Performance test on Water bath	30 (3400)	24 (2810)	85	-	
Vernier caliper (up to 150m)	19 (2200)	-	75	51 (75)	263 (2040)
Test Sieves	15 (1750)	-	NQ	-	
Pressure gauge 0 – 100 bar	25 (2900)	26 (3000)	120	-	422 (3270)
Micrometer (out side) 0-25mm	19 (2200)	-	70	68 (100)	263 (2040)
Performance test of Incubator (3 point)	36 (4100)	27 (3075)	85	-	
Other	12per cent VAT	12per cent VAT	-	Administrative charges 80/consignment	

Lab 2 – Not Accredited

Lab 3 & Lab 4 are National Metrology Centres

NQ – NOT QUOTED

3. RUBBER & FOOTWEAR (No major competitors in Sri Lanka)

Test	Lab 1 ITI, Sri Lanka	Lab 2 Malaysia
	USD (LKR)	USD
IRHD Hardness/Shore A Hardness	13 (1500)	12
Tensile & Elongation	22 (2500)	18
Sole Adhesion	13 (1500)	25
Abrasion	22 (2500)	18
Density	13 (1500)	12
Compression set (at 100 ⁰ C)	30 (3500)	18
Additional	12per cent VAT	70
Additional for preparation	-	25 MYR