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Assessment of Performance of Accredited Laboratories in Pakistan & Gains to Export Sector

A Preliminary Study

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Associated Agencies



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EXPLANATORY NOTES

CLO	Customer Liaison Officer
CRM	Certified Reference Material
EC	European Commission
EMTL	Electrical Measurement & Test Lab
FQCL	Fisheries Quality Control Lab
GQTL	Grain Quality Testing Laboratory
IEC	International Electrotechnical Commission
ILO	Industrial Liaison Officer
ISB	Islamabad
ISO	International Standards Organization
GoP	Government of Pakistan
KHI	Karachi
LHR	Lahore
LRC	Leather Research Centre
MFD	Marine Fisheries Department
MoST	Ministry of Science & Technology
NA	Norwegian Accreditation
NARC	National Agricultural Research Centre
NPSL	National Physical and Standards Laboratory
NRLPD	National Reference Laboratory for Poultry Diseases
PARC	Pakistan Agricultural Research Council
PCRWR	Pakistan Council of Research in Water Resources
PCSIR	Pakistan Council for Scientific and Industrial Research
PNAC	Pakistan National Accreditation Council
PSQCA	Pakistan Standards & Quality Control Authority
PT	Proficiency Testing
SOP	Standard Operating Procedure
TRTA	Trade Related Technical Assistance
TTI	Textile Testing International
UNIDO	United Nations Industrial and Development Organization

I. INTRODUCTION

Laboratory accreditation, achieved through the implementation of the ISO/IEC 17025:2005 standard is regarded as a reliable indicator of technical competence of a laboratory. This uniform approach in accordance with international criteria encourages laboratories to adopt internationally accepted testing and measurement practices. With accreditation, test results produced in one country is accepted in another country and thus the data generated by accredited laboratories is more readily acceptable in the overseas market effectively reducing costs for both the exporter and the importer as it reduces or eliminates the need for products to be retested. Thus while laboratories benefit from obtaining international recognition for the accuracy of their services, companies that export, profit from locally available, internationally accepted testing services with reduced testing time and lower costs.

Similar to other developing countries, Pakistan did not have such an established accreditation system that was a key requirement for full integration of Pakistan into the established world trading system. Thus the country was not in a position to reap the maximum benefits of globalization and trade liberalization due to lack of competitiveness of export products in world markets.

It was at this critical stage, in mid-2004, that the European Commission (EC), joined efforts along with the United Nations Industrial Development Organization (UNIDO) and two other United Nations agencies to initiate a Trade-Related Technical Assistance (TRTA) program in Pakistan. The main objective of this program was to assist Pakistan in building the necessary capacity to address trade related issues, thereby fostering its integration into the world economy and contributing to poverty alleviation. One of the components of this project (implemented by UNIDO) within the purview of TRTA I and TRTA II supported the accreditation of testing and calibration laboratories to conform to the ISO/IEC 17025:2005 standard for laboratory accreditation.

UNIDO also assisted in developing skills of laboratory personnel and technical requirements of accreditation, so that export oriented companies in Pakistan can match the importer country quality requirements where consumers are now extremely conscious of safety and quality.

Since 2004, 49 laboratories (19 under TRTA I and 30 under TRTA II) have been assisted to obtain accreditation. The laboratories were initially accredited by the Norwegian Accreditation (NA) and subsequently by the Pakistan National Accreditation Council (PNAC). The upgraded laboratories were in the areas of chemical and microbiological testing, calibration, electrical testing, mechanical/materials testing and sector specific textile and leather testing.

This preliminary study is carried out as part of the on-going efforts of the TRTA II program and attempts to assess the performance of the accredited laboratories and gains to the export sector that use the services of the laboratories.

II. OBJECTIVE AND DESIGN OF STUDY

The major objective of this study was to assess the performance of accredited laboratories in Pakistan and the gains to the export sector customers that utilize the services of these laboratories. The study was designed as follows:

- a. The performance of the accredited laboratories was determined by the volume of tests carried out and the income generated from such tests
- b. The gains to the export sector were determined via a survey/questionnaire developed to assess the impact of accredited testing services on the export of products

Data was collected from a total of 30 laboratories in 9 Institutions that were supported by the TRTA initiative. The testing scope of these laboratories was in areas of chemical, microbiology, calibration, electrical, mechanical/materials, leather and textiles. The Institutions and the number of laboratories were as follows:

- Grain Quality Testing Laboratory (GQTL), PARC (Pakistan Agricultural Research Council) (1 lab)
- Grain Quality Testing Laboratory (GQTL), NARC (National Agricultural Research Centre) (2 labs)
- Leather Research Centre (LRC) (2 labs)
- Marine Fisheries Department (MFD) (2 labs)
- National Physical and Standards Laboratory (NPSL) (1 lab)
- National Reference Laboratory for Poultry Disease (NRLPD) (1 lab)
- Pakistan Council of Scientific and Industrial Research (PCSIR), Lahore (10 labs)
- Pakistan Council of Scientific and Industrial Research (PCSIR), Karachi (10 labs)
- Pakistan Council of Research in Water Resources (PCRWR) (1 lab)

The list of labs is given in Annex 1. The number of laboratories within each scope of testing is as indicated in Table 1.

Table 1 – Number of laboratories within each scope of testing

Laboratory scope	Number
Calibration	03
Electrical testing	01
Food (chemical) testing	13
Food (microbiology) testing	06
Leather (chemical testing)	02
Leather (physical testing)	02
Mechanical/Materials testing	01
Textile testing	02
Total	30

The number of tests carried out and the revenue generated from such tests within the purview of TRTA II during 2009, 2011 and 2013 were obtained from the laboratories (As per questionnaire Annex 2). The scope specific approach was used to obtain a holistic assessment of the services carried out in the different areas of testing. Details of an assessment carried out previously within the purview of TRTA I are also provided. The accreditation status of the laboratories is given in Annex 3.

The gains to the export sector were determined via a survey/questionnaire (Annex 4) to regular customers of the laboratories.

III. PERFORMANCE OF LABS (TRTA II) – NUMBER OF TESTS

The total number of tests carried out increased by 20% during the period 2009 to 2013. The largest volumes of laboratory services were in the food processing sector, with test volumes increasing by 46% for microbiology testing, and 5% for chemical testing services during the period 2009 to 2013.

The number of services provided for electrical testing, by the Electrical Measurement and Test Lab (EMTL) of PCSIR, Lahore recorded a whopping 72% increase during the same period. Calibration services provided by NPSL, PCSIR Lahore, and PCSIR Karachi, took the lead, securing a 150% increase from 2009 to 2013. This is a significant reward for lab accreditation where the need for precision measurements has been recognized by the export sector.

During the period 2009 to 2013, the leather testing services increased by 40% (physical testing) and 33% (chemical testing), indicating that a substantial number of exporters/producers have availed the locally available accredited testing services.

The textile test count, on the other hand, was just shy of a 20% increase during the same period. This increase could be attributed to the increase in demand for textile testing to meet export market requirements. However, it is relevant to note the private sector competition emerging from labs offering accredited textile testing services such as TTI (Textile Testing International). These labs that are linked with international buyers and textile associations also having a strong marketing strategy are competitors posing a threat to future business of the public sector labs. Leather and textile sectors are two of the five leading export sectors of Pakistan. Services for these two sectors were provided by PCSIR Lahore and the Leather Research Centre, Karachi that have been accredited since 2008 and 2004 respectively.

The mechanical/materials testing services, provided by PCSIR Lahore, recorded an increase of 10% from 2011 to 2013 with accreditation achieved in 2013. This was an improvement given the 13% decrease that the lab had experienced in 2011 before accreditation.

The number of tests carried out within the different scopes of testing is provided in Table 2 and depicted in Charts 1, 2 and 3.

Table 2 – Number of Tests

Laboratory Scope	Number of Tests		
	2009	2011	2013
Calibration (Total)	1574	3065	3896
<i>NPSL</i>	<i>106</i>	<i>210</i>	<i>250</i>
<i>PCSIR Karachi</i>	<i>320</i>	<i>1,035</i>	<i>1,146</i>
<i>PCSIR Lahore</i>	<i>1,145</i>	<i>1,820</i>	<i>2,500</i>
Electrical	1,167	1,115	2,006
Food (chemical)	34,685	26,000	36,477
Food (microbiology)	9,853	10,510	14,409
Leather (chemical)	332	329	443
Leather (physical)	183	214	258
Mechanical/Materials	267	232	256
Textile	95	72	112
Total	48,156	41,537	57,857

Chart 1 – Number of Tests (Food Chemical and Food Microbiology)

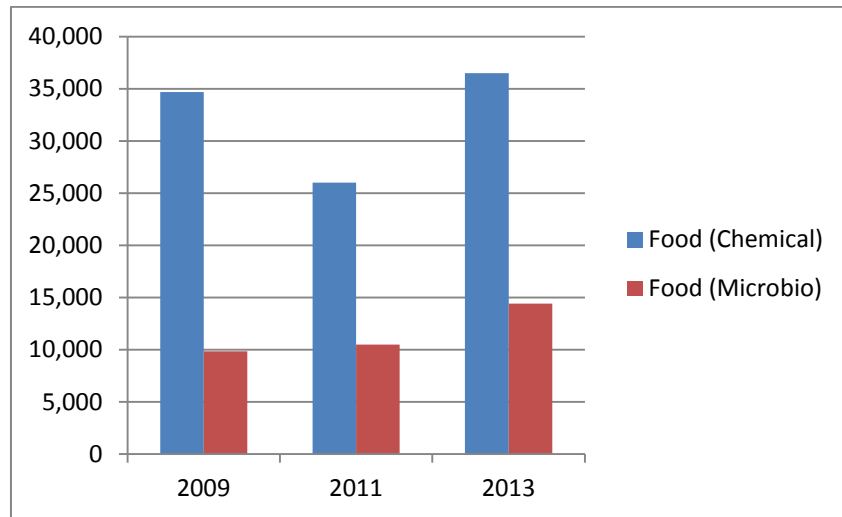


Chart 2 – Number of Tests (Calibration and Electrical)

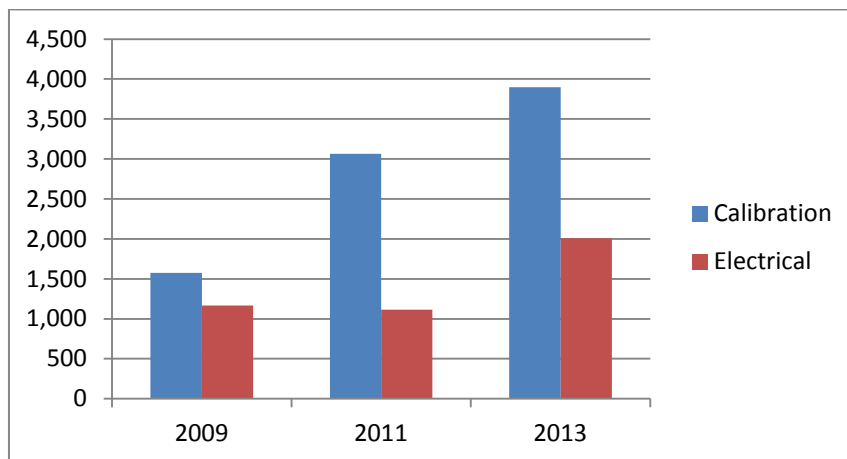
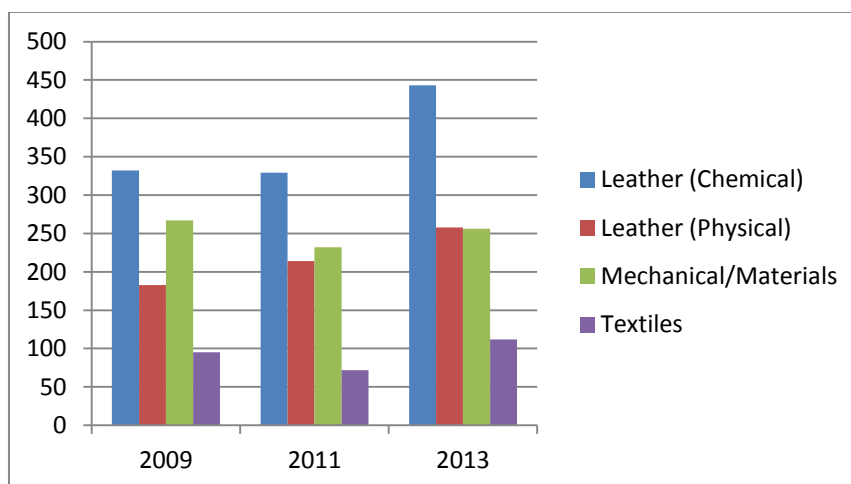


Chart 3 – Number of Tests (Leather (Chemical and Physical), Mechanical/Materials & Textiles)



IV. PERFORMANCE OF LABS (TRTA II) – REVENUE GENERATED

The revenue generated from the tests carried out recorded a 60% increase from 2009 to 2013.

The demand for microbiology testing services for the food sector was significantly high and earned more than a 50% rise in revenue over the years while chemical testing displayed a one third rise. In the fiscal year 2012-2013, food exports increased by 4.82% and accredited test services may have played a role in this increase.

The income from calibration services more than doubled for all three providers (PCSIR Lahore, PCSIR Karachi and NPSL) which positively reaffirms the benefit to local producers and laboratories, and promises future lucrative returns. Detailed analysis shows that NPSL may need to scale up its services and match increasing demands in the sector

Revenue from electrical testing services (provided by EMTL) more than doubled in 2013 after witnessing only a marginal rise in 2011.

Physical testing of leather products recorded an increase of 55%, while chemical testing witnessed a 35% increase. Mechanical/materials testing revenue increased by almost 10 times from 2009 to 2011, and another 8% increase was recorded in 2013 after accreditation.

Revenue from textile testing plunged in 2011 by 50% due to fall in the number of more costly tests such as color fastness, determination of fabric propensity, and determination of linear density of yarn by the skein method carried out by PCSIR Lahore. For the year 2013, revenues were back up, boasting a 75% increase in income generation from 2011. China, one of the largest export partners of Pakistan, has largely increased imports of textile, textile articles and leather goods from Pakistan and if the same trend is maintained, reliability and quality of these products will remain of utmost priority.

The revenue generated from the different scopes of testing is provided in Table 3 and depicted in Charts 4, 5 and 6.

Table 3 – Revenue generated

Laboratory Scope	Revenue Generated (US\$)		
	2009	2011	2013
Calibration (Total)	72,693	132,334	180,620
<i>NPSL</i>	<i>10,204</i>	<i>14,286</i>	<i>20,408</i>
<i>PCSIR Karachi</i>	<i>11,469</i>	<i>27,742</i>	<i>50,926</i>
<i>PCSIR Lahore</i>	<i>51,020</i>	<i>90,306</i>	<i>109,286</i>
Electrical	14,702	15,781	35,082
Food (chemical)	10,747	11,260	14,474
Food (microbiology)	71,613	106,762	109,466
Leather (chemical)	10,747	11,260	14,474
Leather (physical)	3,461	4,327	5,393
Mechanical/Materials	324	2,908	3,133
Textile	2,421	1,286	2,259
Total	361,234	489,512	577,443

Chart 4 – Revenue (US\$) (Food Chemical and Food Microbiology)

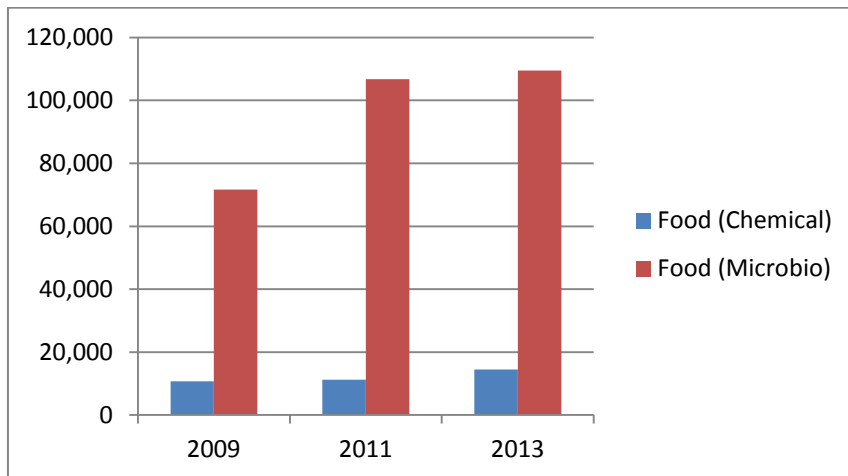


Chart 2 – Revenue (US\$) (Calibration and Electrical)

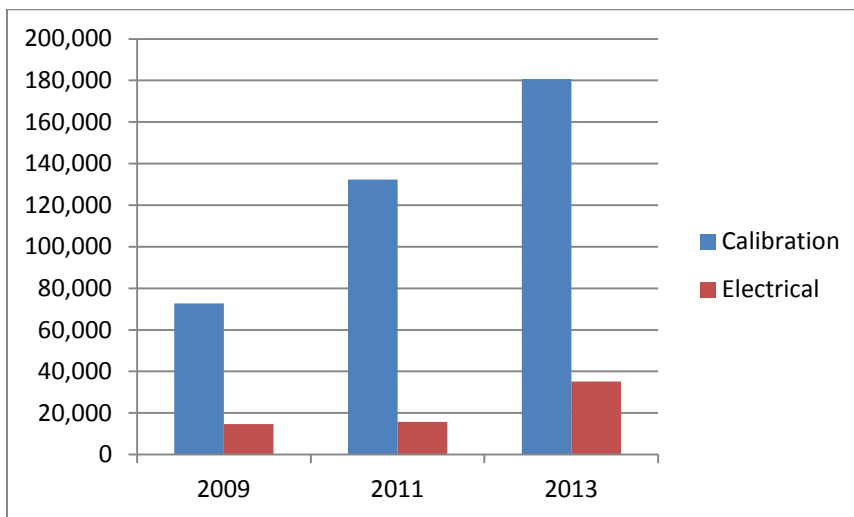
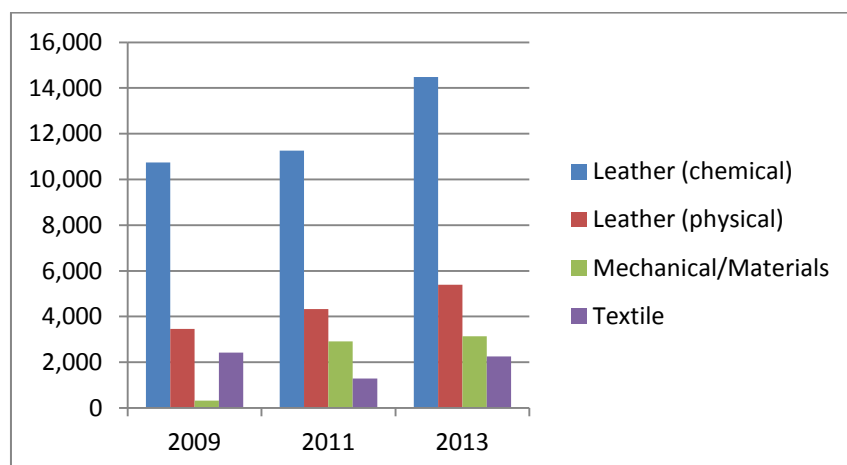


Chart 3 – Revenue (US\$) (Leather (Chemical and Physical), Mechanical/Materials & Textiles)



V. PERFORMANCE OF LABS (TRTA I) – NUMBER OF TESTS & REVENUE GENERATED

To ascertain that information is interpreted in the proper context, results are reported from a previous study carried out to analyze the impact of accreditation on laboratory performance within the purview of the TRTA I programme. A survey of 19 accredited laboratories was conducted for years 2006 (one year before accreditation) and 2008 (one year after accreditation). The results reflect increase in number of tests as well as revenue following accreditation. Overall, the number of tests conducted has more than doubled over the two years under observation, while revenues from accredited labs in totality tripled in 2008.

Table 4 – Number of Tests & Revenue generated

Laboratory Scope	Number of Tests		Revenue Generated (US\$)	
	2006 (before accreditation)	2008 (after accreditation)	2006 (before accreditation)	2008 (after accreditation)
Electrical	927	1,277	1,807	2,943
Food (chemical)	13,054	26,621	35,783	125,034
Food (microbiology)	3,062	21,080	37,654	85,211
Leather	107	281	767	3,019
Textile	185	308	1,517	3,649
Total	17,335	49,567	77,528	219,856

Chart 7 – Number of Tests (TRTA I)

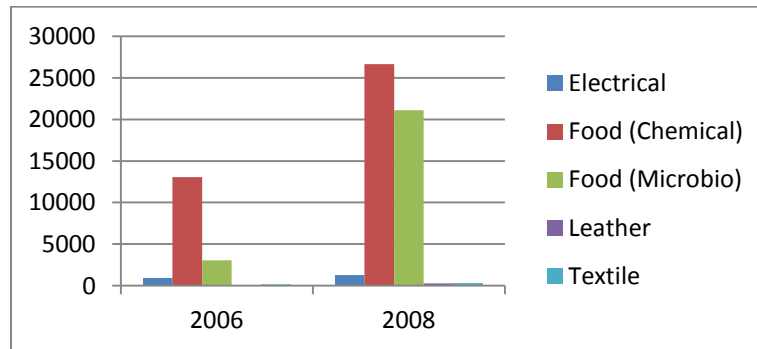
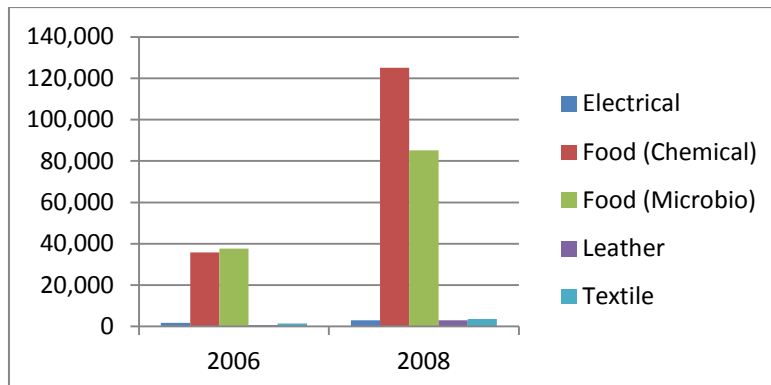


Chart 8 – Revenue (TRTA I)



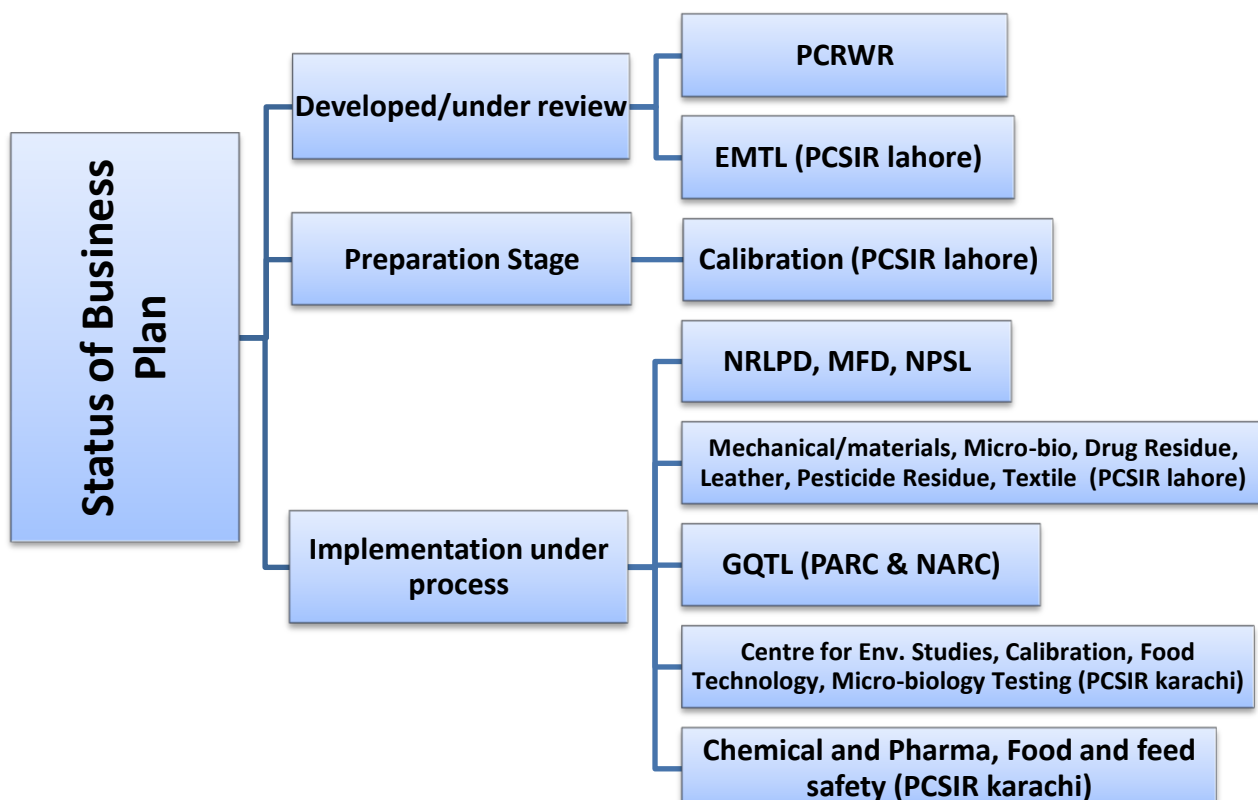
VI. BUSINESS PLANNING FOR LABORATORIES

Laboratories that achieved accreditation status through this program are now being extended support for business planning and implementation of plans. Accredited testing and calibration laboratories need to operate as business units in order to achieve financial sustainability in the long run. This is mainly because, expenditures that include mandatory requirements for accreditation fees, cost of participation in PT schemes, purchase of CRMs and scope expansion need to be maintained by the laboratories, failure of which will result in declining standards of quality and an eventual loss of accreditation status.

A change of mindset for sustainability and customer orientation will be required specifically in the case of public laboratories which have been noted to be not too familiar with the concept of business planning. Training workshops conducted by UNIDO for assistance in development of business plans have supported the process of self-sustainability for laboratories. Relevant personnel have been given guidance and provided tools to develop marketing strategies aimed at retaining current customers, and attracting new ones to the business. Laboratories have also been provided information on concepts of branding, market penetration and communication strategies. In a market place where private sector laboratories are already vying for extra market share, public sector labs need to establish a firm foothold by becoming more oriented to customers to expand the business.

Most of the laboratories have initiated the implementation of a business plan after subsequent workshops and training from International experts on the development of these plans. However, there is much room for improvement in the implementation process with respect to marketing strategies, customer orientation and a change in mind-set of the laboratory personnel. There is also a need for the Customer Liaison Officers (CLOs) to play a greater role in following SOPs developed by the laboratory to achieve business objectives.

Chart 9 – Status of Business Plans



VII. ASSESSMENT OF GAINS TO EXPORT SECTOR

To assess the gains to the export sector, regular customers (based on frequency of testing services availed) of laboratories were targeted to obtain the required information via a survey/questionnaire. The questionnaire was developed with a view to assess the impact of the importance of accredited testing services on the export of products.

The response generated by the questionnaires is expected to be valuable feedback for the laboratories assisted by the TRTA initiative to enhance the scope of testing as well as address concerns with respect to customer satisfaction, both of which plays a role in ensuring the sustainability of accredited labs.

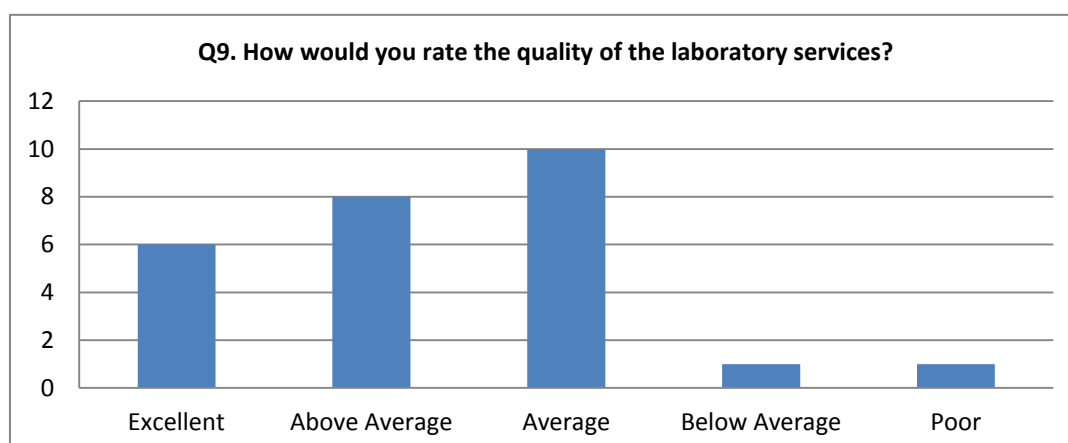
A total of 32 private firms responded to the questionnaire from a wide range of sectors that included textiles, pharmaceuticals, food and poultry. All 32 respondents were unanimous in the belief that using accredited laboratory results will make their product more competitive in the global market, clearly indicating the value of the TRTA programme. The data/analysis also indicated that customers recognize the importance of having products tested locally so that substandard goods are not exported as producers have a chance to rectify production procedures and ensure compliance of goods with international quality standards and controls.

Results also showed that firms have confirmed an increase in exports from between 10-30%. This increase however cannot be totally attributed to the locally available accredited testing services as exports, depend on a number of other factors such as marketability, product and service development to meet international standards, business operations and export subsidies. If the scope of accredited services is enhanced, it may add to the competitiveness of these exports.

Questions were designed to obtain information on the quality of services provided, relevance of services provided by the accredited laboratories, pricing of services as well as to gauge customer satisfaction.

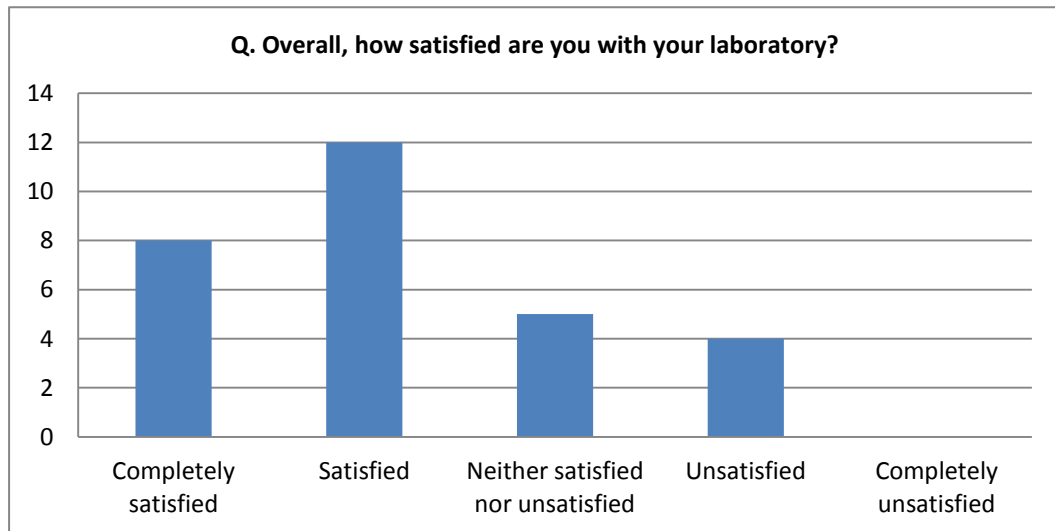
Chart 10 provides the responses with respect to rating of the quality of services provided. According to results, almost three quarters of the respondents trust the testing/measurement facilities offered by their respective laboratory providing some proof of the efficiency and effectiveness of accredited laboratories. However, almost 40% said that services offered were of average quality.

Chart 10 – Rating of Quality of Laboratory Services



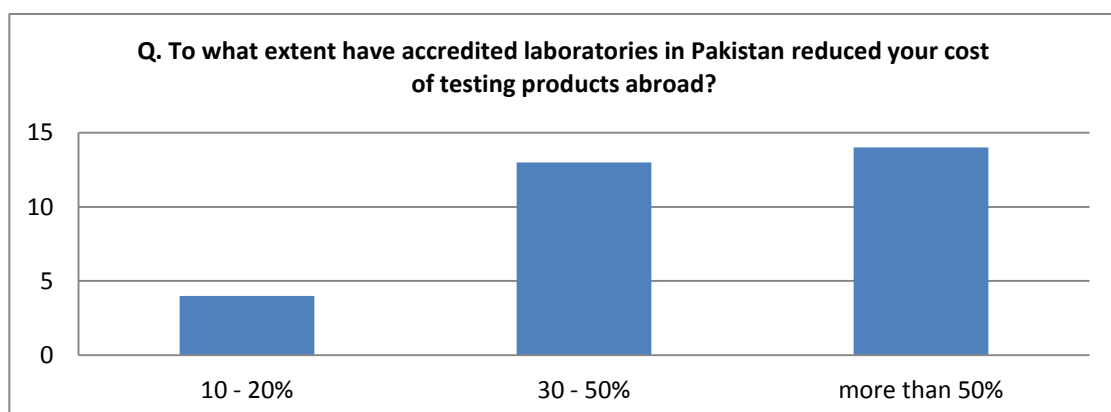
The survey also aimed at checking the overall customer satisfaction. This indicated that a majority of the customers were satisfied (Chart 11). This question was included to check on the retention of business on the long-run.

Chart 11 – Customer satisfaction



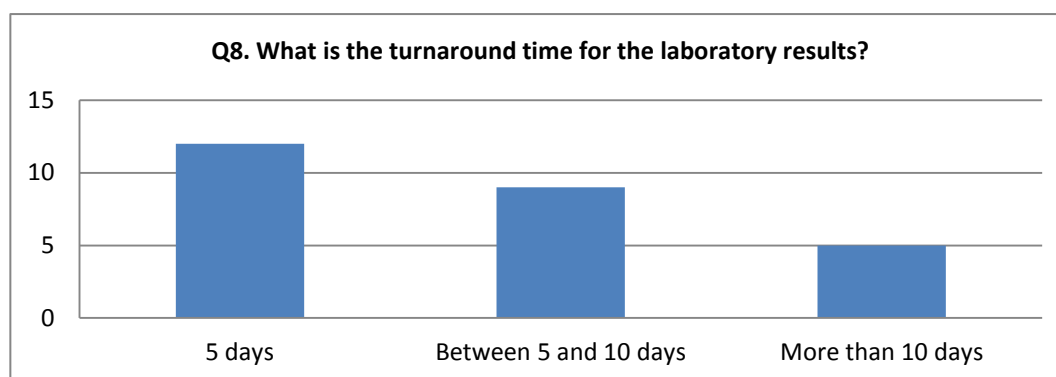
To determine whether there has been a change in export profitability, the respondents were asked questions about the difference in cost of testing services – local verses overseas. Almost half the firms under review claim to have experienced a reduction in cost of over 50%, while many have reduced costs between 30-50% by switching to local testing services as opposed to sending products abroad for testing (Chart 12). Clients from government sectors (such as the Directorate of Labour) also pointed out the need for discounted testing charges in the case of provincial governments.

Chart 12 – Cost of local testing services



Firms were divided in their view of the turnaround time (depending on the laboratory they are referring to). Most were satisfied with results coming in within 5 days, while others had to wait for more than 10 days. Almost a third stated that they had to send their product back for retesting more than once. However, about 20% of customers plan to continue to use their current labs services due to the absence of suitable alternatives.

Chart 13 – Turnaround time



Although most firms state that they will continue to use their current laboratory for future testing of products, 96% respondents believe that public sector laboratories need to make significant progress to compete with private sector laboratories.

This assessment will be more meaningful with regular interaction (in the form of interviews and focus group discussions) with persons in the firms who are directly involved in dealing with laboratories. It is also the case that exporting firms may reserve relevant financials reflecting the direct impact on exports of tested products. This may make conclusions less quantifiable, hence limiting their use for implementation.

VIII. CONCLUSIONS

Findings from the current study provide evidence for the need of accredited laboratory testing services to different extents by exporters in the fields of food, textile, mechanical/materials, electrical, leather, and calibration. The survey of private sector customers of the laboratories indicates that users have benefited from the provision of local accredited testing services and exporters have increased the competitiveness of their products in sectors such as food. At least some part of this competitiveness can be attributed to the TRTA intervention of laboratory accreditation. Firms were also able to reduce costs significantly by switching to local testing services.

It was also revealed that there is room for improvement in the serviceability and marketability of laboratories, especially in comparison with private sector labs. There is also the need for laboratories to expand the scope of testing services, and maintain a business approach by developing and implementing their business plans. Customer relations mechanisms and marketing strategies are other areas to be addressed in order to work towards the self-sustainability of the laboratories.

IX. RECOMMENDATIONS

Based on performance of the public sector laboratories and the interaction with the private sector firms the following recommendations may prove viable for laboratories seeking to expand business for self-sustainability.

- Develop a business outlook to promote and market themselves as providers of accredited testing services
- Improve service delivery and establish competitive prices (after a survey of private sector pricing) in order to compete with emerging competitors.
- Develop a customer oriented approach viz. establish a Customer Liaison Office, set up customer databases, train laboratory personnel in marketing skills and customer relationship management.
- Adopt a customer friendly approach to business for customer retention and expansion
- Implement low cost marketing techniques (e-marketing, articles in magazines, newspapers etc.)
- Motivate laboratory staff to improve performance and decrease turn-around time for test results.
- Increase scope of testing after a need analysis of private sector firms
- Initiate awareness campaigns directed at private sector traders regarding the economic benefits of utilizing ISO/IEC laboratory accredited testing services.

Annex 1 – List of Labs

List of Labs Under Observation	
<p><u>Chemical Testing Labs</u> PCSIR LHR DRUG RESIDUE PCSIR LHR HEAVY METAL PCSIR LHR PESTICIDE RESIDUE GQTL KHI PESTICIDE RESIDUE GQTL KHI MYCOTOXINS GQTL KHI HEAVY METAL PCSIR KHI CES PCSIR KHI CHEM/PHARMA PCSIR KHI FFS PCSIR KHI- FMRRC PCRWR MFD GQTL ISB</p> <p><u>Microbiology Testing Labs</u> PCSIR LHR MICROBIOLOGY GQTL KHI PCSIR KHI MICROBIOLOGY PCRWR MFD GQTL ISB</p>	<p><u>Textile Testing Labs</u> PCSIR LHR TEXTILE PCSIR KHI TEXTILE</p> <p><u>Mechanical /materials Testing Labs</u> PCSIR LHR MECHANICAL/MATERIALS</p> <p><u>Leather (physical testing) Labs</u> PCSIR LHR LEATHER LRC (LTD)</p> <p><u>Leather (chemical testing) Labs</u> PCSIR LHR LEATHER LRC (CRD)</p> <p><u>Electrical Testing Labs</u> PCSIR LHR (EMTL)</p> <p><u>Calibration Labs</u> NPSL PCSIR KHI CALIBRATION PCSIR LHR CALIBRATION</p>

Annex 3 – Accreditation Status of Laboratories

Accreditation Status of Laboratories	
<p>NWQL, PCRWR Accreditation: January 2013, by PNAC Parent Organization: PCRWR</p> <p>PCSIR Lahore <u>Calibration Lab</u> 2005 by PNAC <u>Mechanical/materials Testing Lab</u> 2013 by PNAC <u>Micro-biology Testing Lab</u> 2005 by PNAC <u>Drug Residue Testing Lab</u> May 2013 by PNAC <u>Leather Testing Lab</u> 11 Sept. 2007 (By NA) 19 July 2008 (By PNAC) <u>Pesticide Residue Testing Lab</u> May 2013 by PNAC <u>Textile Testing Lab</u> 11-09-2007, 19-07-2008 <u>Heavy Metal Testing Lab</u> May 2013 by PNAC <u>EMTL</u> 2007 by PNAC</p> <p>NRLPD Accreditation: Request for final assessment sent to PNAC Parent Organization: PARC, ISB</p> <p>LRC 12TH and 13TH July, 2004 by PNAC Parent Organization: PCSIR</p> <p>GQTL, NARC 08-01-2013 by PNAC Parent Organization: PARC</p> <p>GQTL, PARC Accreditation: 14-09-2007 by Norwegian Accreditation Board (Previous) Parent Organization: Pakistan Agricultural Research Council</p>	<p>PCSIR Karachi <u>Chemical and Pharma Labs:</u> Accreditation: 30-01-2004 by PNAC Parent Organization: PCSIR Head Office Islamabad</p> <p><u>Centre for Environmental Studies</u> Accreditation: 30-01-2004 by PNAC Parent Organization: PCSIR Labs Complex, Karachi</p> <p><u>Calibration Lab</u> Accreditation: 30-01-2004 by PNAC Parent Organization: PCSIR Head Office Islamabad</p> <p><u>Food Technology Section, FMRRC</u> Accreditation: 30-01-2004 by PNAC Parent Organization: PCSIR Head Office Islamabad</p> <p><u>Micro-biology Testing Lab</u> Accreditation: February 2004 by PNAC Parent Organization: PCSIR Laboratories Complex, Karachi</p> <p><u>Food and Feed Safety Lab</u> Accreditation: 2004 by PNAC Parent Organization: PCSIR Laboratories Complex, Karachi</p> <p><u>Textile Testing Lab</u> 2004 by PNAC Parent Organization: PCSIR Laboratories Complex, Karachi</p> <p>NPSL Accreditation: 2004 by PNAC Parent Organization: NPSL, Chemical Metrology</p> <p>MFD <u>Chemical and Micro-bio Lab</u> Initially granted by Norwegian Accreditation on 09-10-2008 to 2013 then accredited by PNAC on 18-01-2013 till 17-01-2016 Parent: MoST, GOP</p>

Annex 4 – Questionnaire for Export Sector

Company Name: _____ **Product Tested:** _____

Q. Are your buyers in Pakistan aware of ISO standards and requirements?

- Yes
- No
- Can't say

Q. Do you believe that exporters face numerous technical barriers to trade which can be removed by taking quality control measures such as compliance with ISO standards?

- Yes
- No
- Can't say

Q. Do you believe that achieving accredited laboratory certification will make your product more competitive in the global market?

- Yes
- No
- Can't say

Q. To what extent have accredited laboratories in Pakistan reduced your cost of testing products abroad?

- 10-20%
- 30-50%
- More than 50%

Q. Do you trust the testing/measurement facilities offered by the laboratory?

- Yes
- No
- Somewhat

Q. Do you think that public sector laboratories need to make significant progress to compete with private sector laboratories?

- Yes, definitely
- Somewhat
- Not at all

Q. How many times did you have to send your product back to the laboratory for retesting?

- Never
- Once
- More than once

Q. What is the turnaround time for the laboratory results?

- 5 days

- Between 5 and 10 days
- More than 10 days

Q. How would you rate the quality of the laboratory services?

- Excellent
- Above Average
- Average
- Below Average
- Poor

Q. Do you plan to continue to utilize this laboratory's services?

- Yes
- No
- Please briefly mention why or why not (e.g. professionalism, inefficiency, cost)

Q. Rank the following customer service factors, from most to least important to you, when interacting with the laboratory. (5 = most important; 1= least important) Please tick your choice.

	1	2	3	4	5
Response time					
Representative's customer service skills					
Representative's knowledge/technical skills					
Reliability/Accuracy of results					
Cost of testing services					

Q. Overall, how satisfied are you with your laboratory?

- Completely satisfied
- Satisfied
- Neither satisfied nor unsatisfied
- Unsatisfied
- Completely unsatisfied

Q. To what extent have your exports increased due to availability of accredited laboratories services in Pakistan?

- 10-20%
- 30-50%
- More than 50%

Verified by:

Management

Annex 5 – Status of Business plans

<u>Status of Business Plan</u>	
<p>PCRWR Status of Business Plan: Developed (being amended)</p> <p>PCSIR Lahore <u>Calibration Lab</u> Status of Business Plan: Draft Preparation Stage <u>Mechanical/materials Testing, Micro-bio Testing, Drug Residue, Leather Lab, Pesticide Residue, Textile Testing Lab</u> Status of business plan: Implementation is under process <u>Heavy Metal Testing</u> Status of business Plan: Documentation</p> <p><u>EMTL</u> Status of business Plan: Under review and updating</p> <p>PCSIR Karachi <u>Chemical and Pharma</u> Status of business Plan: In process <u>Centre for Env. Studies, Calibration, Food Technology, Micro-biology Testing Lab</u> Status of business Plan: Updated <u>Food and Feed Safety</u> Status of Business Plan: Updated till January 2014</p>	<p>LRC Not given</p> <p>GQTL, NARC, Islamabad Status of business Plan: In process</p> <p>GQTL, PARC, Karachi Status of Business Plan: Completed and implemented accordingly</p> <p>NPSL Status of Business Plan: Under process</p> <p>MFD <u>Chemical and Micro-bio Lab</u> Status of business Plan: In process</p> <p>NRLPD Status of business Plan: In the state of implementation</p>