

The European Union's INSPIRED Program for Bangladesh

# Technical Assistance to Stimulate Applications for the SME Competitiveness Grant Scheme

## Technical Report: Light Engineering Includes Value Chain Analysis and Proposed Action Plans

*January 2013*



This project is financed by : The European Union



Project Beneficiary : Ministry of Industries  
Government of Bangladesh



The project is implemented by : PKF



**Technical Report  
Light Engineering Sector  
Includes a  
Value Chain Analysis  
and  
Proposed Action Plan**

**Intended to be used as Source Material in the  
Development of SME Competitiveness Grant  
Scheme Applications**

**Bangladesh INSPIRED**

## Table of contents

No.	Subject	Page
1.0	<b>Acronyms</b>	3
2.0	<b>Executive Summary</b>	4
	2.1 Major findings	4
	2.2 Action plan	6
3.0	<b>Background</b>	7
	3.1 Background of the study	7
	3.2 Scope	7
	3.3 Methodology	8
	3.4 Source of information	8
	3.5 Approach	8
4.0	<b>Action Plans for SCGS Grant Applications</b>	9
	4.1 Background	9
	4.2 The role(s) of BMOs/BIOs/NGOs in the Light Engineering Sector	9
	4.3 The existing state of data and firms on the ground	10
	4.4 Sector Issues relating to EU guideline	11
	4.5 Proposed Action plan	11
5.0	<b>Key recommendations</b>	14

**Appendix A** TOR's for Assignment

**Appendix B** A Value Chain Analysis for the light  
engineering Sector

**Appendix C** Template- Proposed Action Plan

**Appendix D** List of Meeting & Contacts

**Appendix E** References

## 1.0 Acronyms

BEIOA	:	Bangladesh Engineering Industry Owners' Association
BIO	:	Business Intermediary Organisation
BSTI	:	Bangladesh Standards and Testing Institution
BSCIC	:	Bangladesh Small & Cottage Industries Corporation
BUET	:	Bangladesh University of Engineering & Technology
CFC	:	Common Facility Centre
CNC	:	Computer Numerical control
EU	:	European Union
GDP	:	Gross Domestic Product
ITC	:	International Trade Organisation
LES	:	Light Engineering Sector
Mol	:	Ministry of Industries
NBR	:	National Bureau of Revenue
R&D	:	Research and Development
SCGS	:	SME Competitiveness Grant Scheme
SEDF	:	SouthAsia Enterprise Development Facility
SMEs	:	Small and Medium Enterprises
SWOT	:	Strengths, Weaknesses, Opportunities and Threads
VCA	:	Value Chain Analysis

## 2.0 Executive Summary

**This technical report is intended for the BIOs and partners who must present to SCGS Grant Applications the EU by January 31 2013.**

This report for the light engineering sector is based on findings derived from meetings with the president & secretary general of Bangladesh Engineering Industry Owners' Association (BEIOA) –light engineering BIO and few light engineering firms, reports, policy papers and research works on the sector. These were consulted to prepare SWOT analyses. The contracted period was one month period to prepare a VCA analysis for this sector. Therefore a light engineering VCA done by the International Trade Centre (ITC) in August 2008 was used as a basis which was updated using information collected through discussions with some entrepreneurs.

The recommendations address major constraints in the sector which can be taken up by the Inspired Programme. They focus on targeted cluster which will be positively affected by the recommended actions. The report elaborates Action Plan which will help the BIOs in preparing quality SCGS Grant Applications.

### 2.1 Major Findings

- a) Light engineering is the capital intensive industry. Due to lack of capital, small manufacturing enterprises dominate the sector. These are scattered throughout the country in various clusters.
- b) Light engineering enterprises proliferated through skilled workers coming out of pioneering enterprises, which created some well-known clusters (Dhaka and Bogra) in several geographical regions.
- c) Ship scraps as raw materials are used for this sector without testing its composition, at the same time competing finished products are also imported, the latter dictating the selling price. Therefore, survival of these light engineering SMEs depend very much on the careful balancing of the import duty structures on finished product and imported raw materials.
- d) Being able to meet the requirement of agriculture, industry and transport sectors of Bangladesh at reasonable price, country's light engineering products have a demand in the domestic market as well as neighbouring countries.
- e) Most of the SME light engineering firms use conventional technology in production process. As a result, they lag behind their foreign competitors.
- f) This sector entrepreneurs employ the fresh unskilled labours without having any formal technical education. These fresh workers are developed as skilled workers through on the job training.

- g) At present, some of entrepreneurs want to install modern CNC technology to target local big corporate houses and international market through improving quality and quantity. Due to lack of skilled manpower in CNC technology, especially programming, operation and trouble shooting, entrepreneurs can not procure CNC technology.
- h) In Bangladesh, light engineering firms are operating at various clusters in different districts. In spite of repeated appeals by Bangladesh Engineering Industry Owners' Association (BEIOA), no single common facility centre (CFC) has been established in any cluster. Establishment of CFC is vital to upgrade technological edge of light engineering sector.
- i) The light engineering has a large domestic market and their quality and price are reasonable. However, further technological improvement will be necessary before they can reign in the domestic market in a better way and can export.
- j) Under CFC, one heat treatment facility is to be established so that engineering firms will treat metal to produce desired characteristics, such as increased hardness; temper. Availability of this service will ensure more longevity of light engineering product.
- k) The products need to be standardized in quality through rigorous testing.
- l) Entrepreneurs need to be trained in financial management, marketing and environmental issues, sub-contracting and HR management.
- m) Dholaikhal Dhaka light engineering cluster comprises of 5,000 engineering units. These engineering firms produce only solid waste. Due to discharging solid waste, these engineering firms belong to green category as per country's environmental regulation. Green category manufacturing firms are, by and large, free from environmental hazards.
- n) Although Bangladesh constitution authorizes only the Parliament to levy any taxes, the Parliament does not have any supporting office with research capabilities to draft and formulate the detailed policies, which has to be done for thousands of items. The responsibility for drafting has been given to NBR whose major task is to collect revenues for the Government. Although it gathers recommendations from different SME trade organizations and individuals, it has no research facilities and capabilities to carry out such an important task. Individual perceptions of NBR officials ultimately dictate the national tax policies, making it easy for vested interest groups, particularly importers to formulate the tax policies in their favour. This explains why most tax policies work against the interests of the manufacturing SMEs.
- o) The light engineering entrepreneurs lack contacts with foreign companies or international R & D firms which is necessary for technical improvement and for seeking export markets.

- p) Indigenous R&D can also provide some solutions which are more appropriate to the needs of these small engineering enterprises, and capabilities exist within the country. Action Plan of this report proposes a central facility or common facility center which may improve the quality and capability of the light engineering SMEs.

## 2.2 Action Plan

**Action Plan:** Bangladesh Engineering Industry Owners' Association (BEIOA) – light engineering BOI has preferred Sub-lot (b) under Lot 1 focused upon actions under the 'intensive growth and consolidation' stage to support light engineering cluster and value chain development project that is common facility centre (CFC) – procurement of joint high –tech machinery . This proposed CFC will upgrade quality of existing light engineering products and introduction of new products.

About 5000 light engineering SMEs is operating in country's largest light engineering cluster named Dholaikhal Dhaka. The entrepreneurs in the cluster, however, are less educated and only a few of them are formally trained. Most of the machines they use are age-old machines imported from India and Pakistan (e.g., SEDF, 2007). It is found that only 15 percent of the entrepreneurs use technical drawings, five percent use process sheets, and only a few use jigs and fixtures (SEDF, 2007). Nonetheless, the effort to upgrade product quality is visible in the cluster. A few entrepreneurs are trying to produce high-quality homogeneous products in a large quantity by employing computerised and numerically controlled (CNC) lathes and hiring designers and engineers from India to run the CNC machines, as skilled labour is quite scarce in Bangladesh to operate sophisticated machines. Recently, a few machinists have been successful in selling their products to the government and large private companies by competing with large importers.

BEIOA (representative of target cluster) will be the applicant with BUET and BSTI as its partners. This CFC will be in existence for at least three years in country's largest light engineering cluster. The **Action Plan** is vital to the survival of light engineering SMEs in competition with imported engineering products. Once CFC will be established at the target light engineering cluster, entrepreneurs will receive following benefits given below:

- a. Metal testing facility of CFC will help entrepreneurs to identify materials of foreign made goods and select proper substitute materials if original materials are not available in the country.
- b. Under the CFC, one CNC training centre will operate. This CNC training centre will produce skilled manpower in the areas of programming, operation and trouble shooting of CNC technology. Adoption of CNC technology will help the cluster to produce quality product on mass scale.

- c. Heat treating is a series of treatments in which heat is used to alter the properties of a metal or alloy. Heat treatments are used for a variety of purposes, the most important being to control the mechanical properties, especially hardness, ductility, strength, toughness, and internal stresses. Different types of heat treatment processes (softening, hardening and surface hardening) will be available at the proposed CFC to help entrepreneurs in producing reliable quality of machinery and spare parts.

## **3.0 Background**

### **3.1 Background of the Study**

The Ministry of Industries of the Government of Bangladesh has selected a number of “booster” sectors for SME that have the potential to contribute significantly to the country’s economy. The sectors are: agriculture processing, natural fibres, leather, plastics, light engineering, electronics, furniture and home textiles. The SME Competitiveness Grant Scheme (SCGS) programme intends to support these chosen sectors through direct development projects and skills development and capacity building of related Business Intermediary Organisations (BIOs). As a part of this programme, the present project has been taken up to provide technical assistance to the Ministry of Industries of the Government of Bangladesh and the SME Foundation, so that the chosen clusters and sector business associations and other business organisations can submit high quality applications under the SCGS. This report is intended to provide the above mentioned assistance to the Light Engineering Sector.

### **3.2 Scope**

The contracted period of 12 (twelve) days for preparing this report is too short for carrying out any elaborate survey or for making proper Value Chain Analyses (VCA). Therefore, most of the analyses were based on available data, produced by different organisations – Government and Non-Government, meetings with president & secretary general of BEIOA and individual engineering firms, and from information gathered through earlier personal work of the consultant himself. The consultant has direct interactions with both the light engineering BIO and light engineering sector, particularly with the sector over a long time, himself being a consultant with various research and training projects. He was involved with several surveys looking at problems and prospects of light engineering sector in various times, took direct part in lobbying with the Government for implementing cluster development projects. Possession of this insider information, combined with that obtained through fresh meetings with the Association helped in identifying very important and appropriate action plan under SCGS. The technical report will emphasise the existing constraints and will formulate recommendations that will be the basis of the Action Plan for BEIOA to prepare SCGS Grant Applications.



### 3.3 Methodology

- i. Meeting with EU representatives/experts and the Team Leader.
- ii. Drawing information from different reports.
- iii. Drawing from the consultant's own direct experience with clusters and firm level information.
- iv. Meetings with the representatives of BEIOA and few entrepreneurs.
- v. Submission of a draft technical report with main findings and recommendations.
- vi. Proposed Action plan for the selected cluster to help preparation of SCGS Grant Applications.

The whole activity was carried out under the guidance of the Team Leader.

### 3.4 Sources of Information

- i. Earlier survey results carried out by the consultant or by others
- ii. Local and foreign sources
- iii. Relevant Bangladesh Government documents
- iv. Personal interaction with entrepreneurs within and outside cluster of the sector

(Source references given in Appendix E)

### 3.5 Approach

Some information was already available in softcopy with the consultant through his direct involvement with this sector. These were updated through fresh interaction with stakeholders and BEIOA representatives. Based on this information, SWOT analyses were carried out on the sector. The contracted time was not adequate to carry out studies to obtain Value Chain Analyses (VCA). VCA performed by an international body, International Trade Centre (ITC), Geneva in 2008 was used as a guide. The VCA were updated through discussions with the president & secretary general of BEIOA and individual light engineering firms. Through this exercise some areas were figured out for the ensuing action plan under the SCGS. The consultant met or talked to persons responsible in various organisation who that were thought to be of importance as partners in the proposed projects. List of meetings are given in Appendix D.

## 4.0 Action Plan for SCGS Grant Applications

The purpose of this chapter is to illustrate how our client, BIO and partners, can translate the information in this report, and our findings, into SCGS Grant Applications. As the purpose of this report is to assist clients with practical information, we have added an Activity Plan which spells out the various steps required from the submission of this report by January 31, 2013, when SCGS Grant Applications are due. This Chart takes into account the EU Guidelines which is an essential road map in this last step.

### 4.1 Background

Light engineering is an important sub-sector of the manufacturing sector. It provides critical support to industrial, agricultural and other sectors of the economy by manufacturing a wide range of spare parts, casting, molds and dies, oil & gas pipeline fittings, light machinery, etc and by providing repair services. With regard to the spare parts, the light engineering industry is known to manufacture spare parts for cement factories, paper mills, jute mills, textile mills, sugar mills, food processing industries, plastic industries, printing industry, fertilizer factories, railway, shipping, marine transport, automobiles, construction related machinery, and pharmaceutical industry, just to name a few. Undoubtedly, light engineering industry supports the very basic requirements of industrialization and plays a key role in keeping other industries running. LES may be grouped under the following categories:

**a) Machine shops:** Machine shops use cast iron (foundry products) as basic materials and do the machining jobs. They produce finished form of metal products (machinery & spare parts).

**b) Repair workshops:** They do different types of repair jobs required by the agricultural, industrial or transport sector. They either directly contact clients to procure these jobs or receive job orders at their premises. They carry out the activities mostly by themselves. Only in some cases they have to go out for getting some jobs done in foundry or to other process facilitating units like electroplating, adding plastic components makers, etc.

### 4.2 The role(s) of BMOs/BIOs/NGOs in this sector

The organisations or institutes involved in the proposed action plan of the light engineering sector are BEIOA, BUET and BSTI, whose detailed names have been provided in the Acronyms page.

For Action Plan, BEIOA will be the applicant with BUET and BSTI as the partners. BUET is the prime Engineering University in the country bringing in knowledge and expertise in technological matters and will provide all the planning and consulting for

this proposed CFC. BSTI as the country's lone Government agency to design standardisation will be able to provide the much needed expertise and connections with foreign resources.

#### **4.3 The existing state of data and firms on the ground**

- Light Engineering Sector (LES) have emerged as the cornerstone of development providing the platform for industrial growth, enhancement of trade and economic prosperity. The light engineering industries have potency to play a significant role in technological and economical development along with a vast scope of employment generation.
- The Government of Bangladesh has declared the sector as a most priority sector in its Export Policy 2009 and thrust sector in its Industry Policy - 2010.
- Light Engineering Sector is classified as a sub-sector of Small & Medium Enterprises (SMEs). An estimate shows that there are about 40,000 light engineering industries in the country. According to the estimate around 0.6 million semi-skilled, skilled and technically educated people and innovative entrepreneurs are actively engaged with the sector.
- In Bangladesh, over 90 percent of light engineering industries are serving the local needs of the people. There are strong backward and forward linkages between the light engineering industries and other sector (such as agriculture, industry and automobile) of the economy in Bangladesh.
- There are about 1200 light engineering industries presently enlisted in Bangladesh Small & Cottage Industries Corporation (BSCIC) who are supplying various products (such as spare parts, equipment, capital machinery) under sub contacting scheme.
- The product types of light engineering sector are: Automobile spare parts, Railway engine & rail line spare parts, Bicycle & cycle rickshaw, Machine tools, Jute & Textiles machines and spare parts, Chemical industries machines and spare parts, Sugar and food industries machines & spare parts, Engineering & metal industries spare parts, Ship industries spare parts, Agricultural machines accessories and spare parts. The light engineering industries of Bangladesh is currently producing more than 10000 types of quality machinery, spares and accessories.
- The consumer of light engineering products and services are both the public and private sector. Currently, the private sector is the major consumer of the light engineering products.
- A number of potential export quality light engineering products are going to foreign market on direct and subcontracting means. These are spare parts of Paper & Cement mills, Bicycle, Fancy light fitting, Construction equipment, Battery, Voltage stabilizer, Iron chain, Cast iron articles, Carbon rod, Automobile spares, Electronics items, and Stainless steel wares.

- The infrastructure facilities (such as electricity, gas, transportation, and telecommunication) and labour cost are comparatively lesser than other countries as such the sector shows high potentiality of growth and development.

#### **4.4 Sector Issues relating to EU Guidelines**

Issues that are relevant in view of the present state of the sector are covered by the proposed action plan. Not only BOI members, but also whole cluster will be benefited through implementation of this action plan. The number of beneficiaries will run into many thousands and the contribution to the national economy will be astounding. It would be difficult to give a number, but if this action plan is successful and the Government policies are changed to favour the local light engineering manufacturing SMEs, it can be guessed that the GDP will go nearly to 8% from present level 6.2%.

The other vital issue is that of quality improvement and skill development, etc. This is covered under lot 1b. Dhaka Dholaikhal light engineering cluster has about 5000 members who will be benefited by this action plan.

#### **4.5 Proposed Action Plan from the Technical Study**

##### **Common Facility Centre for metal testing, CNC skill training and heat treatment facility (under lot 1B)**

###### **i. *Background:***

Light engineering sector has consistently grown over the years, and an ever growing large domestic market has helped it to sustain in spite of various difficulties common to all the manufacturing SMEs in Bangladesh. The price and quality of the products are reasonable, but there is much to improve. Particularly in the face of competition from foreign products, even in the domestic market, there is an urgent need to improve the product quality and quantity. The local light engineering firms are also eyeing an export market, but both the product quality and the volume of production per worker need to be improved in order to compete in the international market. In order to improve the quality, necessary initiative should be undertaken at doorstep of light engineering SMEs at Dholaikhal Dhaka Cluster.

In the first phase, attempts should be made to increase the product quality through receiving metal testing and heat treatment services. Side by side the entrepreneurs should be made aware about the availability of training services in CNC technology under proposed CFC. The steps required here are:

- a. Provide testing of metal used in the production of light engineering product.
- b. Offer training in CNC technology

- c. Providing heat treatment services.

In the second phase the focus should be process improvement, targeted for volume production and export. This will require CNC machinery for production of higher quality and quantity. However, this also needs highly trained skilled manpower in CNC technology which is not available in Bangladesh right now. Therefore, training of manpower in modern methods of production is also a necessity for this sector.

Therefore, under lot 1B, a Common Facility Centre to provide a central facility for metal testing, heat treatment and skill training of technicians is proposed. The proposed central facility will be used jointly by the small light engineering units of the association under consideration (BEIOA) and cluster, who cannot afford the expensive machinery and manpower needed.

ii. **Objectives:**

Providing a central laboratory with metal testing, CNC skill training, and heat treatment for making light engineering product more competitive in local and international market.

iii. **Key stakeholders group:**

- a. BEIOA (applicant): The main association of light engineering SMEs
- b. BUET (Partner): Provide expert consulting services
- c. BSTI (Partner): Provide expert advice and consulting in quality.

iv. **Type of activities:**

- a. Metal testing facility of CFC will help entrepreneurs to identify materials of foreign made goods and select proper substitute materials if original materials are not available in the country.
- b. Under the CFC, one CNC training centre will operate. This training centre will produce skilled manpower in different areas of CNC technology.
- c. Different types of heat treatment processes (softening, hardening and surface hardening) will be available at the proposed CFC to help entrepreneurs in producing reliable quality of machinery and spare parts.

v. **Specification of related outputs and results:**

Establishment of all the activities listed in item **iv** above.

vi. **Description of linkages/relationships between activity clusters:**

BEIOA is the main initiator and coordinator of this activity. Partner BUET brings in knowledge and expertise for preparing project profiles and to provide detailed planning for this central facility. They can also provide some skill training. BSTI provides information and support for quality standardisation, particularly that needed for export and competing with foreign goods in local market.

**Action: Common Facility Centre**

**Background:** Dhaka Dholaikhal light engineering cluster suffers from absence of dedicated CFC.

- **Objective:** to implement a dedicated CFC with required facilities and equipment.
- **Key stakeholders group:** BIO members.
- **Overall Cost of the Action Plan = €800,000 = Tk.8 crore(to apply for €750,000)**
- **Type of activities:**
  - **Procurement of CNC training equipment**  
Purchase of CNC training materials and equipment
- **Specification of related outputs and results:** This cluster benefits permanently from training facilities.
- **Description of linkages/relationships between activity clusters:** BIO
- **Timeframe:**
- **Estimated cost: € 500,000= Tk.5,00,00,000**
  - **Procurement of metal testing equipment**  
Purchase of metal testing lab, machinery and equipment
- **Specification of related outputs and results:** This cluster benefits permanently to identify composition of metal.
- **Description of linkages/relationships between activity clusters:** BIO
- **Timeframe:** 3 years
- **Estimated cost: € 50,000= Tk.50,00,000**
  - **Procurement of heat treatment plant.**  
Purchase of heat treatment plant.
- **Specification of related outputs and results:** This cluster benefits by treating metal of product for higher longevity.
- **Description of linkages/relationships between activity clusters:** BIO
- **Timeframe:**
- **Estimated cost: €250,000= Tk.2,50,00,000**

## 5. Key Recommendations

- I. Establish a central facility for Dholaikhal Dhaka light engineering cluster providing multiple facilities including metal testing, skills development in CNC technology and heat treatment facility to improve production technology, product and quantity.
- II. BIO's representative light engineering cluster that is engaged in manufacturing of machinery and spare parts may find the SME Competitive Grant Scheme as a unique opportunity to carry the cluster to its full potentials. With the development of country's largest light engineering cluster, eventually the whole light engineering sector will be benefited through potential technology transfer.

## Appendix A

### TOR's for Assignment

#### Local Expert for Light Engineering, Value Chains and the Grant Scheme

##### 1. Background

PKF (UK) LLP is leading an international consortium comprised of WYG (UK), Harewelle (UK) and SEBA Limited (Bangladesh) and is responsible for technical assistance to the Ministry of Industries of the Government of Bangladesh and the SME Foundation. The project will assist clusters, sector business associations and other business organisations in order to submit high quality applications under the SME competitiveness grant scheme. The overall objective of the project is reduced poverty in Bangladesh by supporting the development of SMEs, and the purpose is to enhance competitiveness and sustainable pro-poor growth of SMEs in Bangladesh.

Support will be provided to clusters using value chain initiatives that seek to increase firm level competitiveness in the following sectors: agro-processing, natural fibres, leather products, plastics, light engineering, electronics, furniture and home textiles/crafts.

The project also provides capacity building to business intermediary organisations (BIOs) in lobbying, advocacy, networking, public-private sector dialogue and the provision of business development services to members. The project commenced in February 2012 and will be completed in January 2014.

##### 2. Scope of Work and Activities

The Government of Bangladesh and specifically the Ministry of Industries has identified a number of “booster” sectors representing higher growth rates and which can, therefore make a significant contribution to the economy in terms of value added, employment, technology, innovation, exports and import substitution.

This consultancy builds on this by working with the BIOS and BMOs representing these sectors, carrying out value chain and/or feasibility studies and relating these results directly to a formal Action Plan for the Grant Scheme.

Specifically, the consultant will be required to under the following:

1. Meet with INSPIRED program staff including the Team Leader, Chief Technical Adviser, Senior VCA Expert and BIO Expert for a briefing on the program.
2. Meet with all of the major BIOs/BMOs representing this sector to:



- a. Review the Grant Scheme and SCGS Grant Applications to determine which project ideas might be a priority?
- b. Meet with other key stakeholders to review these issues.
- c. Determine if there are high growth sub-sectors or products which should be focused on in value chain analysis?
- d. Based on this information, if value chain analysis has already been done, update findings.
- e. If value chain analysis has not been done, undertake a rapid assessment of a few sub-sectors of high growth.
- f. Complete the value chain analysis by evaluating the main gaps and opportunities with concrete recommendations on how these can be addressed. Recommendations must be precise. (The initial briefing will discuss the use of SMART or SWAT analysis.)
- g. It is essential that the value chain analysis be of relevance to project ideas put forward by the BIOs and stakeholders for the Grant Scheme so findings can be used to prepare a formal Action Plan.
- h. Prepare an Action Plan(s) for the key project ideas put forward by the BIOs with the assistance of INSPIRED program staff, Senior VCA Expert and Grant Scheme Guidelines Experts.
- i. This Action Plan should accurately reflect the needs and concerns of the BIOs and take fully into account Grant Scheme Guidelines, in particular the Table of Contents for preparing Concept Notes.
- j. Prepare a draft technical report which provides the following:
  - 1. Main findings from discussions with BIOs and stakeholders.
  - 2. Details on the key project ideas from BIOs and stakeholders for SCGS Grant Applications.
  - 3. Value chain analysis or an update.
  - 4. An Action Plan(s) for SCGS Grant Applications.
  - 5. Submit the draft report and revise according to comments from program staff.
  - 6. Submit a final technical report by the contract deadline.

SI	Activities/Deliverables	Days allocated
01	Meet with project staff including the Team Leader, Chief Technical Advisor, Senior Value Chain Expert for a briefing on this assignment.	1 days
02	Meet with relevant BIOs/BMOs to explain the Grant Scheme and solicit their opinions on the feasibility of developing new project activities for this Scheme. Come away with concrete project development ideas which can be turned into Action Plans	1 days

03	Undertake value chain analysis on 2-3 products/sub-sectors or update the data base if VCA has already been undertaken. Identify constraints and opportunities and provide a concrete list of specific recommendations which can be tied to Action Plans.	3 days
04	Undertake SMART Analysis on these constraints and opportunities. To be discussed at the briefing session.	2 days
05	Based on feedback from BIOs/stakeholders and data from VCA analysis prepare specific Action Plans which can be incorporated into SCGS Grant Applications and which follow Guidelines.	2 days
06	Submit the first draft of a technical report.	2 days
07	Incorporate revisions and submit a final technical report.	1 days

### 3. Qualifications of the consultant:

The local consultant should have the following experience and qualifications:

- a. A Bachelor Degree in Engineering, business or a similar relevant discipline.
- b. At least five years working in the engineering industry/value chains/sector assessment/feasibility studies in Bangladesh.
- c. Working experience in private sector is essential. Preference will be given to those who have worked both for private and development sectors.
- d. An excellent business relationship with important value chain players and BIOs in the leather sector in Bangladesh.
- e. Excellent communication skills in English and Bangla.
- f. Good computer and internet skills.
- g. An ability to work under pressure and conform to deadlines.
- h. Ability to produce high quality technical reports in English is essential.

### 4. Place of Work

The place of work will be mostly in Dhaka but outside trips may be required.

### 5. Inputs

This assignment will be for 12 working days.

### 6. Reporting Requirements

The local expert will report to the Chief Technical Adviser.

### 7. Deliverables

1. Final technical report.
2. The assignment must be completed by January 31, 2013

## Appendix B

### Technical Report on the Value Chain Analysis for the Light Engineering Sector.

#### 1. Sector Contribution to the Economy

Light Engineering Sector in Bangladesh is one of the sub-sectors of SMEs. This sector occupies a unique position in the economy of Bangladesh. It prudently acts as feeder of support industries to all other industries and plays a vital role in the socio-economic development of the country. These industries have potentials to make significant contribution towards technological and economic development along with wide opportunities for employment generation. These small & medium scale industries have made substantial contribution to Gross Domestic Product (GDP) during the last few decades and created appreciable employment opportunities. Some key features of the industry.

- Around 40,000 Light Engineering Industries are operating all over the country, which engaged in production and manufacturing of highly value added engineering goods and services with the value of annual turn over more than TK. 30,000 crore. In recognizing this fact, the government has declared this sector as a thrust sector in its Industry Policy –2010;
- In the Export Policy-2009, the sector has been attached as one of the Highest Priority Sector and 10% cash incentive is granted for the export of light engineering products;
- Country's 6th Five Plan Document has given importance on light engineering sector for poverty reduction.
- Around 6 lack people are directly involved with the light engineering sector;
- The Ministry of Commerce has established Light Engineering Product Business Promotion Council and SME Foundation has attached the industry as Booster Sector

Light engineering SMEs are operating in various clusters scattered to the country. According to SME Cluster mapping Study conducted by SME Foundation in 2012, 31 light engineering clusters were identified. Cluster development is seen as a way of addressing the problems faced by the light engineering sector in Bangladesh and rapidly increasing cluster competitiveness.

#### 2. Sales and Markets

Since the development of the sector, entrepreneurs are providing its products and services to local market. LES keeps the national economy running through offering cost-effective maintenance services and much-required spares & capital machinery. Light engineering industry has two segments of market i.e. local market and export

market. In the local demand, there is a secular growth around 30% per annum. Size of local market is around US\$2billion.

In the mean-time, local light engineering industry has stepped their presence in export market. The major products include agriculture machinery, motor cycle, metal furniture, AC, construction machinery, iron sheet, G.I. pipe, cast iron articles, aluminium household articles, iron chain, SS ware, machineries, diesel engine, motor parts, bicycle, light fittings, dry cell battery. Given below:

Year	Export (million US\$)
2004-05	84.15
2005-06	126
2006-07	236.91
2007-08	219.68
2008-09	189.48
2009-10	311.09
2010-11	221.61

**Source: EPB Bangladesh**

### 3. Product Lines

**Agricultural Sector:** Seed drill, pedal thresher, auto thresher, shallow tube well, grain dryer, spare parts of Power tiller, withering machine, spare parts of tractor, hand pump, centrifugal pump, insecticides sprayer, crankshaft, gear & pinion, piston & piston ring, liner, spare parts of diesel Irrigation engine, poultry & fish feed machine & parts, rice mill parts.

**Textile Sector:** Bobbin Pin, Cloth Support , Harness Lever Bush , Bim Support Connector , Shedding Shaft, Gear Pinion, Heavy Duty Under Pick Plain Loom, Light Duty Under Pick Plain Loom, V Puli, Motor Puli, Kaflin Motor, Class Plate, Class Disk, Class Shape, Kapur Bush, Carbon bush, Coupling, Shaft, Elmer , Elmer , Bracket, Lever .

**Jute Sector :** Truck & Rail, Hackle Bar, Overhead Machine, Lifter Bracket, Ratchet Raod, Pressing Roller, Delivering Roller Boss, Bobbin carrier, Returning Roller, Pinion, Shaft, Gear,

**Tea Sector :** VFBV, CTC Machine, Ghooghi, CFM, Rotor Vane, Withering Trough Fan, Tea Carrying Conveyor, Green Leaf Shifter, Humidifier, Axial Flow Fan , Mono Rail, Cooling System, Sorting Machine.

**Construction Sector:** Mixture Machine, Piling Machine, Construction Crane, Soil Moulding, Machine, Auto bricks manufacturing machine, brick crusher, stone crusher, Concrete Mixer Machine, Vibrator Machine.

**Automobile Sector:** Spring, Break Drum, Bush, Pulley, Piston ring, Gudgeon Pin, Gudgeon Bush, Slip, Head Sheet Valve, Auto Crankshaft, Hanger pin, Head Seat, Gear Shaft, Nut & Bolt, Auto valve, Auto gas cylinder, Connecting Bush, Shaft, cabling, Sit Socket, Block Liner, Booster Connecting, Booster Body, Booster Pin, Automobile Filter, Radiator Engine Fan, CNG Engine Fan, Motor cycle Bearing, Chain cover, Motor Cycle Pinion, Motor Cycle Sit Cover, Motor Cycle carrier, Motor Cycle cylinder, Motor Cycle paddle

**Paper & Pulp Sector:** Manual Knife Gate valve, Agitator, Pneumatic valve, Compressor pump, Gear Coupling, Felt roll, helical gear, Spur gear, Herringbone gear, Compressor, Roller, Pump, Cutter.

**Pharmaceutical Sector:** Pharmaceutical Blister Packing Machine, Tablet Packing Machine, Tablet Steep machine, Tray Dryer, Tablet Machine 16 punch, Fluid bed dryer Machine SS, Film cutting machine Tablet, Liquid Filling, Sealing and Labelling Machine, Pharmaceutical Powder Mixer Machine, Tablet Steep machine, Malit Mill Machine, Wrapping machine.

**Mould & Die Sector:** Industrial parts, Egg tray, Garment Hanger, Water Filter, Cookeries, Plastic Bottle, cosmetic, toy, sanitary and shoe.

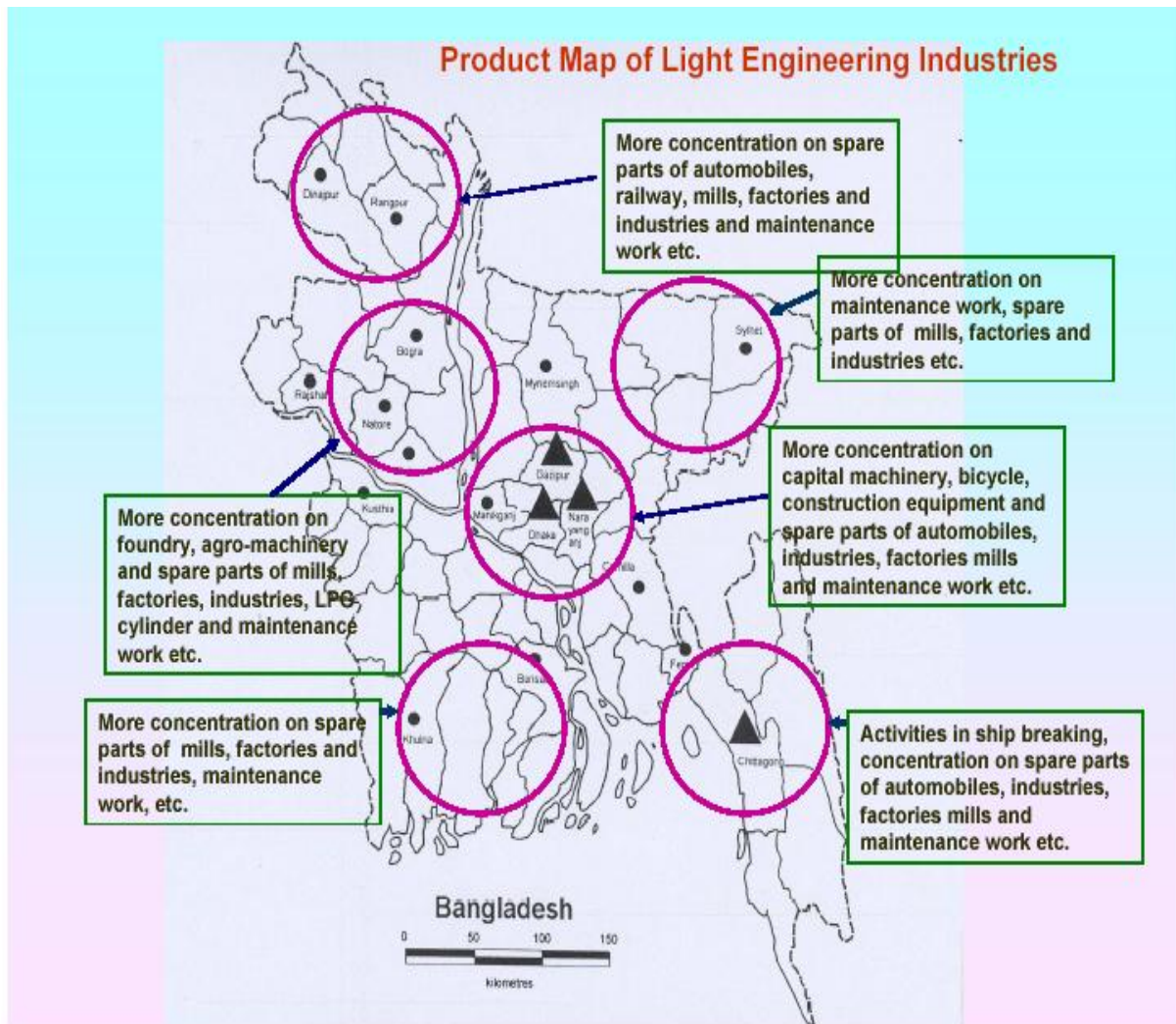
**Railway Sector:** Centre p-boat, Brake bim, Brake shaft, 2 inc. CI coupling, Brake hamper, Rail channel pin & cable, bearing, elbow, mini-pulley, bolt, cylinder liner, piston, compressor, S.P. Cylinder, hanger, horn.

**Marine Sector:** Marine Propeller Shaft, Sukan Bush, Sukan, Head, Head Valve, Ring, Fiver Bush.

**Machine Tools:** Lathe Machine, Power Press, shaper, Hydraulic press, Cooling Tower

#### 4. Product Map of Light Engineering Industries

In the SME Cluster Mapping Study, 31 light engineering clusters were identified. Cluster development is seen as a way to rapidly increase cluster competitiveness. Major light engineering clusters are located in the districts including Dhaka, Dholaikhal, Chittagong, Kishorganj, Mymensingh Sadar, Narayanganj Sadar, Jessore Sadar, Khulna City Corporation, Bogra, Pabna Sadar, Srimangal Moulvibazar, Sayedpur, Nilphamari, Brahmanbaria Sadar, and Gazipur Sadar.



Light Engineering Cluster Mapping by IFC-SEDF in 2007

## 6. The Typical Value Chain of Light Engineering Sector

### 6.1 Methodology and Approach

The study applied a mix of the secondary literature review and interviews with president & secretary general of BEIOA and cluster light engineering firms to develop general idea on value chain of Dholaikhal Dhaka light engineering cluster. With the help of information of value chain analysis, key constraints of value chain and recommendations were identified. The overall research work was completed as outlined below.

#### 6.1.1 Secondary Literature Review

Different secondary literature were collected and reviewed to develop a general idea on various aspects of value chain analysis of light engineering sector. Industrial



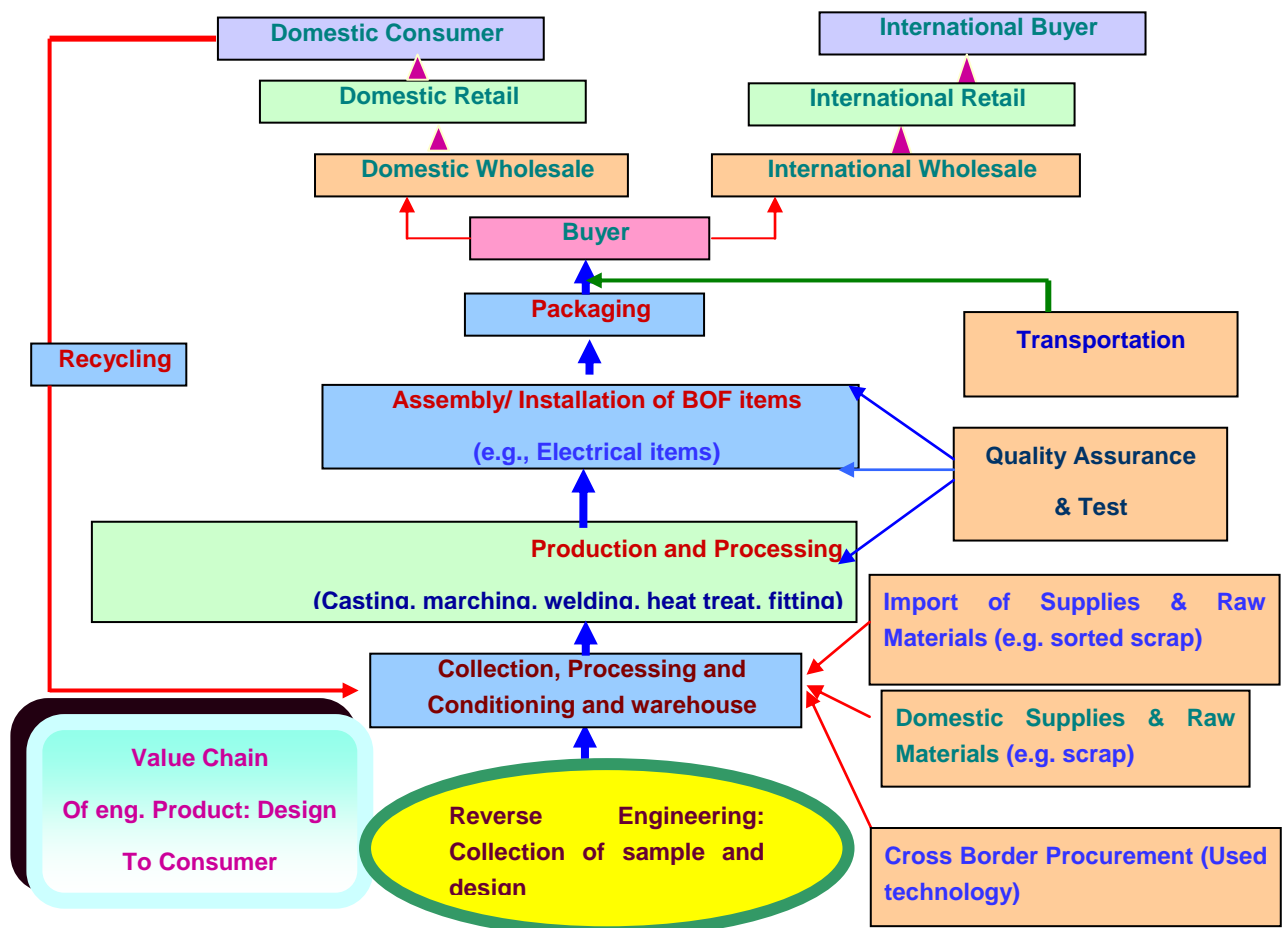
policy 2010, export policy 2009, published research papers, and papers (soft copies) of various formats from internet will be collected prior to developing the study tools.

### 6.1.2 Field Visits and Consultation with Stakeholders

This was backed up with meetings with BEIOA representatives and visits to few light engineering firms at Dholaikhal Dhaka cluster. Discussions were held with concerned persons with BUET and BSTI.

### 6.2 Value Chain Mapping of the Sector

The value chain of LES describes the full range of activities, which are required to bring a product or service from conception, through the different phases of receiving work order, designing of product, procuring materials, manufacturing, delivery to final consumers, logistics, sales-after customer service. The following figure shows a typical value chain of LES.



### 6.3 Identified Constraints in Dholaikhal Light Engineering Cluster

#### (a) Constraints Related to Absence of CFC

- Due to non-existence of CFC at Dholaikhal Dhaka light engineering cluster, the light engineering firms cannot access to necessary services like metal testing, CNC technology training and heat treatment facility. These services are required to ensure quality product on larger scale.

#### (b) Constraints Related to Raw materials

- Price hike (sky rocketing) of general raw materials such as scrap, sorted scrap, plain carbon steel, alloy steel, furnace oil, copper alloys, stainless steel etc.
- Sometimes testing of raw materials is required for some specialized job. Normally, this facility is not available in the Dholaikhal Dhaka light engineering cluster or any other light engineering cluster.

#### (c) Constraints Related to Finance

- Lengthy and complicated lending procedure to receive bank loans.
- High interest rate on bank loan.
- Non-availability of sufficient working capital.
- Non-availability of venture capital

#### (d) Constraints Related to Modern Technology

- Light engineering firms use conventional technology due to lack of availability of skilled manpower in CNC technology.

#### (e) Constraints Related to Quality Certification

- There is no institution to undertake standardization and testing of machinery and spare parts. Even though, BSTI provides standard of different products produced in Bangladesh, till now it has made very few standards on light engineering products. Due to lack of quality certification, local machines and spare parts face branding problem compared to imported product.



**(f) Constraints Related to Environmental Issues**

- Ship scraps as raw materials are used for the light engineering sector. Ship scraps are procured from ship-breaking yards operating at Shitakundu, Chittagong. Due to absence of Central Waste Treatment, Storage & Disposal Facility at Shitakundu, little care is taken in addressing environmental hazards and human safety aspect.

**6.4 SWOT of Light Engineering Sector**

<p><b>Strength</b></p> <ul style="list-style-type: none"> <li>• Availability of trainable labours at competitive cost.</li> <li>• Minimum Duty on import of basic raw materials.</li> <li>• LES grows as a cluster at light engineering firms accumulated areas that is good for vendor development or clustering.</li> <li>• 10% cash incentive for light engineering product export.</li> </ul>	<p><b>Weaknesses</b></p> <ul style="list-style-type: none"> <li>• Leading or core assembling companies that require parts suppliers lack.</li> <li>• Production facilities and technology are not modernized.</li> <li>• Production management skills including TQM are at low level.</li> <li>• Die-making technology is a bottleneck of LES in Bangladesh.</li> <li>• Technical institutions like metal testing, R&amp;D, quality assurance, accredited inspection lack</li> <li>• Marketing ability is insufficient for export promotion.</li> </ul>
<p><b>Opportunities</b></p> <ul style="list-style-type: none"> <li>• Marketing size is huge in view of import substitution for industrial machinery and spare parts. .</li> <li>• Labor costs are increasing in rival countries in Asia.</li> <li>• Huge export potential as country’s presence in-between India and China.</li> <li>• Availability of trade concessions (GSP, SAPTA and WTO Hong Kong declaration 2005: Rich countries giving DFQF access to 97 percent of products including light engineering products from LDCs).</li> </ul>	<p><b>Threats</b></p> <ul style="list-style-type: none"> <li>• Absence of cluster development projects including CFC.</li> <li>• No basic steel industry in Bangladesh.</li> <li>• Domestic market becomes reluctant to buy domestic products.</li> <li>• No international quality and testing laboratory.</li> <li>• Little care taken to address environmental hazards and human safety aspect at unorganized ship-breaking yards from where raw materials are procured.</li> </ul>

## 7. Recommendations

- a) Establishment of CFC at Dholaikhal Dhaka light engineering cluster with facilities of metal testing, CNC training and heat treatment that will be jointly used by cluster engineering firms.

### **CFC for Light Engineering Cluster – Mardan, Pakistan**

The agriculture light engineering cluster of Mardan is scattered in Takht Bhai, Gujar Garhi and Sher Garh. There are more than 200 small and medium level of enterprises involved in making of Agricultural tools and implements. A Common Facility Training Center (CFC) was established in the cluster to provide advanced machinery and training facility to engineering SMEs. The CFC was established in at a suitable location in Mardan in close vicinity to the industrial clusters in coordination with the stakeholders.

- b) Set up raw material bank and testing facility at Dhaka Dholaikhal light engineering cluster to relax raw material related constraints.
- c) Most cluster light engineering firms rely on informal sector financing to meet their needs. For ensuring good credit environment, following steps are considered:
- Bangladesh Bank should introduce special credit facility for commercial banks so that commercial banks will offer single digit loans to light engineering firms.
  - -Introduce factoring or account receivable based funding to meet working capital requirement of engineering firms.
- d) Develop adequate skilled manpower in CNC technology and create special fund for cluster engineering firms to procure modern machinery.
- e) For testing and certification to meet the quality standards of locally manufactured agro machines, there is need to strengthen BSTI with new technology and skilled manpower to prepare quality standards and conduct testing.

Industry people press the government to set up an environment compliant ship-breaking industrial park at Shitakondou, Chittagong that is in Gujarat, India to control environmental hazards and human safety aspects.

## Appendix C

### Action Plan Template

- Background:
- Objectives:
- Key stakeholders group:
- Type of activities:
- Specification of related outputs and results:
- Description of linkages/relationships between activity clusters:
- Timeframe:

Estimated cost: € = Tk.

## Appendix D

### List of Meetings

Meeting with EU experts and Team Leader

Meeting with BEIOA representatives (twice)

Meeting with light engineering firms operating at Dhaka Dholaikhal light engineering cluster.

Meeting with concerned people at BUET.

Meeting with BSTI representative.

## Appendix E

### References

Md. Masum Talukder presented a keynote titled “Export Potentials and Problems of Light Engineering Sector of Bangladesh” in a Seminar organised by Export Promotion Bureau (EPB), 23rd May 2012.

Md. Masum Talukder presented a paper titled “ESTABLISHING INDUSTRIAL ZONE AND UPGRDATION OF BOGRA AGRO ENGINEERING TECHNOLOGY” in the seminar organised by Campaign for Sustainable Rural Livelihoods (CSRL) in March 2010.

Md. Masum Talukder, Study Team Member, Light Engineering Sector, Prepared 31 light engineering cluster profiles in SME Cluster Mapping Project Conducted by SME Foundation 2011.

Md. Masum Talukder, Light Engineering Sector Survey & Product Mapping Report -2011.

A strategy for developing the Light Engineering sector of Bangladesh – August 2008 by ITC Expert under Bangladesh Quality Support Programme (BQSP) Funded by the European Commission (EC).

Economic Policy Paper on Light Engineering & Electronics Enterprise in Bangladesh Prepared under the DCCI-CIPE/ERRA Project, 2005.

Survey of six SME sectors, contracted by SME Foundation, prepared by CDS, 2008.

The Light Engineering Industry in Bangladesh by AT Capital Research, 17 April 2008.

Md. Masum Talukder presented a paper titled “Problems in Developing Agro Machinery Sector in Bangladesh and Its Solution” in 4th National knowledge Convention organised by a group of development organisations (ActionAid Bangladesh, Plan Bangladesh and Practical Action Bangladesh) on 12th December 2012.