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Competitiveness and Growth Hindrances of Light Engineering Industry of Bangladesh: A Study on Micro, Small and Medium-Sized Enterprise (MSME) Owners

Md. Akhtaruzzaman Talukder
Graduate Student, Institute of Business Administration, University of Dhaka, Dhaka 1000, Bangladesh

Sheikh Morshed Jahan
Associate Professor, Institute of Business Administration, University of Dhaka, Dhaka 1000, Bangladesh

Abstract
Indigenous light engineering talents of Dholaikhal and Jinjira have long been life line for the manufacturing industries and automobile sector of Bangladesh. Recent studies have shown that they are passing through hard times and the Government institutions are not supporting them to face the challenges and capture opportunities of their competitiveness and growth. First generation indigenous light engineering entrepreneurs have passed on the sector to the next generation. Much around them has changed. This study attempts to assess the major hindrances of achieving competitiveness and growth for the light engineering MSMEs in the changed scenario. A qualitative study was conducted through depth interview of the micro, small and medium sized LE enterprise owners, observation and validation workshop method. It looked beyond the words of the interviewees and read between the assembly lines of the factories. Findings show that the major hindrance to their competiveness and growth cultural factors, rather than popular view of resource scarcity.
Keywords: Light engineering industry, micro, small and medium enterprises, growth and competitiveness, hindrance, Bangladesh, institutional role, need-delivery gap matrix.

1. Introduction

In the perspective of Bangladesh Light Engineering (LE) enterprises are micro, small and medium sized firms that produce parts for industrial machinery, heavy equipment, automobiles and appliances; and tools, small machinery, equipment and appliance or sanitary ware mainly by metals through engineering and technological processes (Uddin, 2009). Before 1970 there were a few industrial establishments in Bangladesh that relied on foreign machines and spare parts. However, some mechanics having experience in the industries started producing some parts. After liberation the abandoned industries were nationalized and big engineering corporations emerged. Following industrial liberalization in Bangladesh in the late 1970s big private industrial units were set up. It created a huge demand of spare parts and mechanical fittings. Local LE enterprises proved to be cheap suppliers of spare parts to the industries than the spare parts supplied by machinery manufacturers. The 1980s saw the explosive growth of LE enterprises with the patronization of the government of that period.

Even now LE sector is providing critical support to automobile, industrial, agricultural and construction sectors by supplying cheap spare parts, castings, moulds and dices, oil and gas pipeline fittings and light machinery as well repair services (Talukder & Jahan, 2016). The LE sector as 'the mother of all sectors' provides backup support to cement, paper, jute, textile, sugar, food processing, railway, shipping, garments industry by repair and maintenance (LEPBPC, 2016).

But there is a growing concern among the LE enterprises that they are facing severe challenges from imported spare parts mainly from China, Taiwan, Thailand and India. They complain that cheap foreign one-time spare parts, tools and light machinery are being dumped in Bangladesh due to Government inaction. Government Institutions are not providing any support to the local LE enterprises to enable them to face enterprise level, industry level and cross border challenges. As a result their competitiveness has waned and those have been put into big trouble. A recent study on Bangladesh LE sector (Talukder & Jahan, 2016) cautioned that LE industry might extinct if it is not given support through appropriate institutions. Although it has the potential to thrive with the development of the economy, the sector may face stagnation and eventual demise if policy support, institutional support and infrastructural backbone are not given (Uddin, 2009).

The purpose of the present study is to explore the hindrances to competiveness and growth of the LE sector in Bangladesh.

1.1 Objectives of the Research

The broad objective of the research is to assess the hindrances of growth and competitiveness from empirical evidence.

The specific objectives are as follows:

- To understand what the entrepreneurs feel about challenges and opportunities of their competiveness and

growth;
- To assess how far they can grow in the current scenario;
- To identify the core hindrances to their competitiveness and growth.

1.2 Methodology

The primary method of the study was Depth Interview Method of the LE entrepreneurs. Depth interview is much the same as psychological, clinical interview (Zikmund, Carr, Adhikari & Griffin, 2013), but with a different purpose, in which the researcher asks many questions and follows up each with probes for additional elaboration. Depth interview provides more insight into a particular individual than do focus group study (Zikmund, Carr, Adhikari & Griffin, 2013). This method is particularly useful in exploratory study as the gesture, posture, approach and other visual cues can be used for interpreting the oral information. For comprehensive information collection on competitiveness and growth challenges and opportunities faced by the LE enterprise owners the Triple Triangle Framework (Jahan, 2008) was used. The responses of LE entrepreneurs on challenges and opportunities were compared with the opinion of experts. Role of five major institutions which are mandated to support (Talukder & Jahan, 2016) the LE sector namely Small and Medium Enterprises Foundation (SMEF), Bangladesh Small and Cottage Industries Corporation (BSCIC), Bangladesh Industrial Training and Assistance Centre (BITAC), Bangladesh Engineering Industries Owners' Association (BEIOA) and Export Promotion Bureau (EPB) have been used as reference to the opinion of LE entrepreneurs.

Secondary materials on the sector, Government policies, demand dynamics, and product offerings were used to cross check the opinions of the enterprise owners. A validation workshop was held involving industry stakeholders in cooperation with BEIOA.

1.3 Data Collection and Data Sources

Data were collected both from secondary and primary sources. Primary data on a range of issues related to competitiveness and growth of LE Sector in Bangladesh were collected by depth interviews of LE entrepreneurs. Each depth interview lasted from half an hour to two hours depending on the cooperation, progress of probing process, and information surfaced. The interview lasted until generation of new information stopped. The information provided by 16entrepreneurs has been used in the analysis. It was found that no new information was obtained from the last 2-3 interviews.

There are seven roads in the Dholaikhal area where the LE enterprises concentrated. Randomly, I chose Tipu Sultan Road and Taherbag and approached the entrepreneurs who were available on the days I visited the area. I spent three days in the area. Additionally, BEIOA provided a list of prominent LE entrepreneurs. From the list, I chose two entrepreneurs of Konabari BSCIC Industrial Estate and Savar. The characteristics of interviewees are given below:

1.4 Limitations

The scope of the study was limited to areas popularly known as Dholaikhal in old Dhaka, Gazipur and Savar. There are LE enterprises all over Bangladesh. The limited time was the main obstacle to interviewing owners from other parts of the country. Some owners were reluctant to give time due to their inconveniences. Some refused to give interview expressing their disappointment about the impact of studies. This was also a form of feedback from the owners. However, the respondents who agreed to give a small time finally ended up giving as long time as the interviewer needed. Praiseworthy cooperation of BEIOA helped us to collect all necessary data despite limitations.

2. Literature Review

2.1 Overview of Light Engineering Sector

Light engineering enterprises are micro, small or medium sized firms those produce or repair metallic parts, equipment, tool, or sanitary ware for industrial, agricultural, automobile machinery by employing engineering or technological process(Talukder& Jahan, 2016).

Such LE enterprises exist in all countries. However, they thrive in developing countries due to low cost of production. Most of the literature refer to some common attributes of LE enterprises like small firm, engineering or technological production process, related to metal working or electromechanical components making, indigenous technical skill etc. (Rabbani, 2005; Ahmed & Bakht, 2010; Quadir, Mahmud, 2009). The sector is broadly divided into three components- foundries, machine shops and repair workshops (Uddin, 2009). Rabbani (2005) stressed that "Light Engineering should have a local engineering aspect in the design of a product or its making, i.e., where indigenous engineering intellect or skill has a contribution. The main processes are cutting, blending, machining, shaping, milling, hobbing, rolling, extruding, drawing, sawing etc."(Adhikary & McVay, 2006). The sector has three outputs: complete machinery, spare parts and repair service.

2.2 Value Chain of Light Engineering Sector

The value chain (Porter, 1985) of LE sector shows that the competitiveness and growth of the sector depends on performance, collaboration and competition of all actors in the chain- core market actors, market support facilities and facilitators.

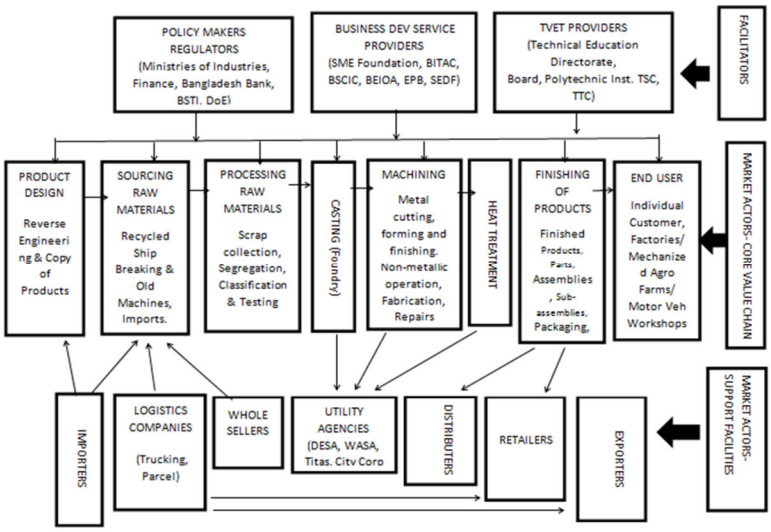

Figure 1 **:** Value Chain of LE Sector ((Talukder & Jahan, 2016)

2.3 Challenges and Opportunities of LE Sector

BEIOA classified the challenges into five major heads - access to finance, backdated technology, lack of policy support, lack of skills and lack of infrastructure. A recent study (Talukder & Jahan, 2016) identified ten major challenges of LE sector- backdated technology, lack of world class skills, lack of infrastructure, lack of scale of operations, poor quality of product, competition with imported spare parts, demand uncertainties, lack of marketing skills, lack of policy support and lack of access to finance.

LE enterprises in Bangladesh use old conventional lathe, boring, milling, shaping, drilling, grinding etc. machines (INSPIRED, 2013; Talukder & Jahan, 2016). They do not have access to Computer Aided Numerically Controlled (CNC) machines and Computer Aided Design (CAD) technology, Heat Treatment facility and testing machines which are critical for design and production of quality products. They mainly use scrap materials from ship break (INSPIRED, 2013). They cannot measure the strength of raw materials and hence they provide over strength or under-strength to the products. The owners are not investing in acquiring new technology due to uncertainty of returns owing to uncertainty of demand, high cost of finance, narrow profit margin, unavailability of skilled staff etc. Old technology is causing poor quality, narrow product range and lower scale of operations (Talukder & Jahan, 2016).

Due to lack of marketing skills, timid or complacent mindset and uncertain demands LE owners take the safe path of on-demand low quantity production. Ultimate result is that due lack of scale benefit the cost per unit is higher than imported Chinese, Taiwanese, Thai or Indian products. So, together with poor quality and lack of compliance higher cost make the local LE products less competitive in the domestic and overseas market. On the other hand dumping of foreign products is crowding out unguarded local LE products (Talukder & Jahan, 2016).

Alongside challenges, there are ample opportunities for the LE sector of Bangladesh to capture. There are scopes of getting subcontracting orders from machinery and automobile manufacturers of developed countries as they would change subcontractors from China, Thailand, Taiwan, Malaysia, Indonesia, Turkey etc. due to rise of labour cost in those countries. Growth in the local industry would increase domestic demand. Expanded technical and vocational education in the country is supplying a large number of engineers, technologists and technicians. There is a vibrant banking system in the country. The existence of clusters of LE enterprises offers the scope of planned development for the sector (Foundation, 2013).

But institutional preparedness to face challenges and capture opportunities is weak in Bangladesh. SME Foundation lacks resources, focus and capacity. BSCIC has long been neglecting LE sector. Despite having focus on industrial technology BITAC has narrowed down its role to training and a limited technical service. BEIOA, as a business association, has not been as strong as other business associations of the country for various reasons. EPB has not made the sector conscious about the vast opportunities abroad. Talukder and Jahan (2016) have proposed to set up a LE Foundation by the Government with comprehensive mandate, sufficient resources, authority and technical capacity to help the sector take off as a driver of growth and employment.

2.4 Demand Dynamics

Imported spare parts are leading in popularity among industrial users in Bangladesh. But according to studies (Uddin & Jahan, 2017), neither local spare parts nor imported spare parts have clear lead on product attributes. Even then the imported spare parts are favored by the users due to better perception of finishing, better marketing, ready availability and comparable price.

3. Findings

3.1 Challenges Reported by LE MSME Owners

Depth interviews generated a number of challenges the sector faces and opportunities it can capture. Triple Triangle Framework (Jahan, 2008) was used to identify and classify the challenges and opportunities of LE sector according to the LE entrepreneurs.

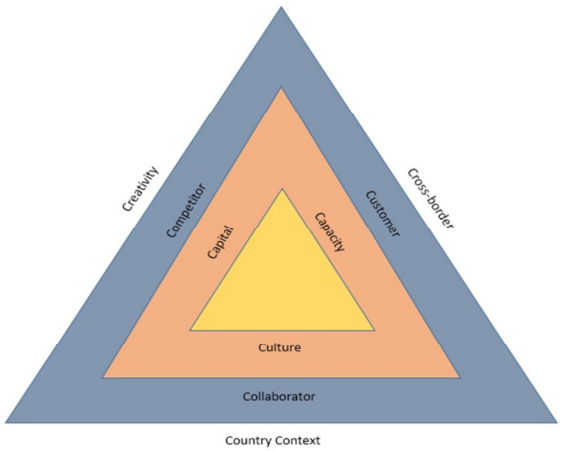

Figure 2: Triple Triangle Framework (Jahan, 2008)

While different entrepreneurs have different views based on their experiences some common challenges and opportunities emerged from depth interviews. Views of LE entrepreneurs are different from those of experts on some core issues. In the enterprise domain main challenges are cultural factors. Industry domain is dominated by challenges of competition from cheap imports. In the outer domain major challenges are technological drawbacks due to partly lack of intention of entrepreneurs to upgrade. Challenges those are mentioned by experts in another study for example lack of policy support from the Government, absence of institutional support, and high bank interest were also raised by the entrepreneurs.

Table 2: Challenges & Opportunities Reported by LE Entrepreneurs

Domain	Type	Description of Challenges & Opportunities
Enterprise Domain	Capital	High interest rate of bank loans
	Culture	Loss of interest in working in the LE factories. The owners are not interested about taking loan. Old machines, small shops and dirty environment. No women employment.
	Capacity	The owners are worker turned owners Shortage of staff
Industry Domain	Customer	Type of products needed by customers has changed, but local LE producers have been slow to respond to this change. Stagnation of local demand. Subcontracting opportunities.
	Competitor	Competitive price cuts by local LE owners. Inflow of cheap foreign LE products.
	Collaborator	Absence of institutional support**.**
Outer domain	Cross border	Foreign companies (e.g. Toyota, Honda) are making contacts with larger LE enterprises for outsourcing activities.
	Creativity	Specialization of bigger sized owners in textile & garment machinery and accessories. Technology is backdated. Little interest to upgrade technology. Environmental pollution free.
	Country context	Lack of policy support. Harassment by government agencies.

Source: Authors

3.1.1 Inflow of Cheap Foreign LE Products

Chinese, Taiwanese, Thai and Indian cheap one-time spare parts are flooding the markets. These are not high quality, often cannot be repaired and are replaced when the old one gets troubled. This phenomenon renders the local LE entrepreneurs out of work. The entrepreneurs are aware of the free market economy. So, they do not complain against the government for allowing those products into the market. But the owners fear that if it continues unabated it may challenge survival of the local LE products.

3.1.2 Technology is backdated

The machines are backdated. But the entrepreneurs feel that these are enough for serving the domestic market. The old machines require more raw materials for a unit of product due to manual handling of settings. This renders more than 50% raw materials wastage. It affects costing. The new technology has more precise settings and hence minimizes wastage of raw materials. New machines enable better finishing of products.

3.1.3 Little interest to upgrade technology

Worrying fact is that the entrepreneurs are not interested to procure latest technology. They are complacent with current state of technology. It seems that they do not feel need of latest technology as they do not want to upgrade quality of products and operational efficiency.

3.1.4 Type of products needed by customers has changed

Industrial machinery has changed to more automatic, microchips and robotics oriented. The parts of machinery have become more compact, IC based and one-time readymade. The local LE producers are stuck with old skills and old products. With the change of technology of machinery the skill and product list has to be renewed.

3.1.5 Shortage of staff

LE factories are facing shortage of technical staff. After a staff becomes experienced in factory job and acquires technical skills he leaves the job to set up independent factory of his own. The factory owner hires a new staff who does not have the required skill level. Acquiring skills is time consuming. So, the factories often find it hard to fill the skill gap created by loss of core technical staff. Some factories were found to be shut due to shortage of core technical staff. Apart from that there is serious shortage of staff skilled in operation of modern Computer Aided Numerically Controlled (CNC) machines and Computer Aided Design (CAD) technology.

3.1.6 Loss of interest in working in the LE factories

The sector is not getting vital new blood as the new generation is not opting to work in the LE factories as the work is hard, ill paid, and not prestigious in the society. Most of the factories are being run by middle aged workers who joined this sector 10-20 years ago. The next generation of LE enterprise owners is not willing to take charge of the family owned LE business. Organizational culture of factories is not attracting new recruits and not retaining the existing staff.

3.1.7 Lack of Policy Support

The LE enterprise owners feel that they are neglected due to small size of their businesses. Government does not care whether they survive or die. The Government is not taking into consideration contribution of this sector in employment generation and supply of import substitution products. The customs duty of raw materials of LE machines is about 32-35% while the customs duty of imported LE products is about 1%. The importers of LE products are not giving Value Added Tax (VAT) as they are not produced here. The local producers pay VAT, so their products become more costly.

3.1.8 Harassment by Public Agencies

The enterprises face harassment by different public agencies including labor department, fire services department, taxation department, environment department and police department. There might be legitimate reason of action of those departments against an enterprise, but the enterprises have got feeling that they are sometimes harassment unjustifiably by wrong explanation of laws.

3.1.9 Stagnation of Local Demand

The owners feel that the local demand is not rising although economy is growing. This is because the new industries are not being set up and the existing industries are not running at full capacity due to lack of confidence of business enterprises in the economy. It is also reported that BITAC, a government organization, which was established to support engineering enterprises has become a supplier of light engineering products of about Taka 1 billion per annum. It is again outsourcing the work to the third party. The LE enterprises are being deprived from direct orders from consumers.

3.1.10 Absence of Institutional Support

SME Foundation is sitting on faulty definition of SME which is diverting SME loans to big corporate giants although the Government is taking credit of supporting the SMEs. The entrepreneurs cannot import the appropriate raw materials, do not know the quality of their inputs and are not sure about the standards of the inputs. BITAC could undertake the responsibility of importing the appropriate raw materials for them. BSTI does not cooperate to give standards for LE products that prevents them from marketing to the multinational companies, local big corporate industries and to the foreign markets. BITAC can take a role like Trading Corporation of Bangladesh (TCB), which import consumer goods to fill supply gaps in the local market, in order

to supply inputs to the LE enterprises. The BEIOA can take the role like Bangladesh Garment Manufacturers' and Exporters' Association (BGMEA) to design and implement code of standards, to supply inputs and to negotiate favorable terms with the customers.

3.1.11 The entrepreneurs are not interested in taking loan

Asked about if they feel difficulty in getting loans from commercial banks, most answered that they did not need any loan for expansion or running of business. They do not need to buy new machines as the old machines were good enough for their purpose. They say that they do not have space to install machines.

3.1.12 High Interest Rate

The entrepreneurs hesitate to buy new machines using commercial bank loans. There is substantial uncertainty of the return on investment. So, they consider the burden of high interest rate as risky. Some also said that they had nothing to offer as collateral other than the factory and machines, but the banks required real estate. They mentioned that Turkey has got a reserve fund under the disposal of LE authority from which interest for the bank loan is paid. The entrepreneur only repays the principal. In India the interest rate for LE sector borrowers is single digit.

3.1.13 Old Machines, Small Shops and Dirty Environment

Most of the LE factories or repair workshops are small with 2-3 machines. Some shops have even just one machine doing a single job for other shops. Most machines are 10-15 years old. They rarely replaced any machine recently. The factories are set up in a small space and are dirty. The small LE workshops are seen to be packed with machines and no space to even move within. Working condition is extremely unhealthy.

3.1.14 The entrepreneurs are worker turned owners

Most of the LE MSME owners are workers-turned-entrepreneurs. Although modern machinery requires a large investment, typical small LE factories or workshops can be established with sub-continental machines at a low cost. As a result most of old factories and workshops have lost their original workers who have established small workshops and have diverted the customers to their own shops. They are mostly engaged in repair services. This trend has put the old factories into shortage of skilled staff and restricted their expansion and has generated new small shops. The small shops try to attract customer by lowering prices and compromising quality. This phenomenon has contributed to overall quality fall in the LE sector of Bangladesh. The LE enterprises have not taken corporate shape and failed to brand products. However, some entrepreneurs are qualified engineers and have sufficient technical background who operate product based LE enterprises.

3.1.15 Competitive Price Cuts

As there is no standardization of products and no collective effort to guard against unusual price cuts for dumping the small factories/ shops often engage in drastic price cuts to catch or retain customers. The factories with good machines, staff and standards do not agree to cut prices as they feel that the quality cannot be ensured at that lower level of cost. Ultimately everyone has to take the lower price prevailing in the market, which affects profit margin and impetus to maintain quality.

3.1.16 No women employment

There is almost no women employment in the LE sector. The nature of job requires hard labour and there is no fixed working time in this sector. So, LE factories are not suitable for female staff. However, there are some jobs which require soft skills. But those positions are not created in micro and small enterprises.

3.1.17 Environmental pollution free

The wastes are recyclable. The wastes of cutting process are known as 'Babri' which is sold at high prices which are recycled to make raw materials. There is no chemical or fly ash disposal of these factories. So, the LE sector is environment friendly.

3.2 Opportunities Reported by LE entrepreneurs

3.2.1 Specialization in Textile & Garment Machinery and Accessories

Capitalizing on the increase in demand of weaving, knit, garment and dying machinery and accessories many smart LE entrepreneurs have turned to manufacturing those machines and accessories. This is an opportunity that can be explored by other LE firms. There are many such fields where the entrepreneurs can pursue specialization.

3.2.2 Subcontracting Opportunities

TOYOTA, HONDA and some other foreign engineering manufacturers contacted some LE enterprises for procuring parts on outsourcing basis from Bangladesh. But they were not confident of availability of quality raw materials, testing facility, skills of workers etc. in Bangladesh.

3.2.3 Foreign Engineering Giants are Making Contacts

Some foreign engineering and automobile giants have made enquires to some entrepreneurs. It appears that they are thinking of alternative sources of outsourcing supplier of parts. This is due to increase in cost of labor in China, Taiwan and Thailand.

3.3 Challenges and Opportunities: Differences in Perspectives

A recent study (Talukder & Jahan, 2016) identified ten major challenges and seven opportunities of LE industry of Bangladesh. But the current study found that priority of LE entrepreneurs are not equally focused on all challenges and opportunities those were mentioned by experts. It does not necessarily mean that experts and LE business entrepreneurs have contrasting views. But the priorities of LE entrepreneurs indicate areas of immediate attention. The previous study of the same authors found that major institutions those should contribute to the backbone of the LE business ecosystem (Kanter,2012) in Bangladesh are not responsive to challenges and opportunities of the sector.

A comparative analysis of expert and entrepreneur perspectives on challenges and opportunities of LE sector is given below. The role of institutions to overcome the challenges and to capture opportunities is also mentioned side by side with views on challenges and opportunities. Putting this together with the role that major institutions currently play offers a 'Need-Delivery Gap' matrix. This matrix would provide ample insights for policy makers and stakeholders on potential intervention needs.

Table 2:
Need-Delivery Gap: Comparative Analysis of Expert and Entrepreneur Perspective on LE Challenges vis-à-vis the Role of Institutions

Challenges		Institutional Role		Gap
Expert Perspective (Talukder & Jahan, 2016)	Entrepreneur Perspective			
Backdated technology: LE enterprises use old conventional machines in the factory or workshop. The enterprises do not own Computer Aided Numerically Controlled (CNC) machines and Computer Aided Design (CAD), Heat Treatment and Testing Machines which are essential for design and quality of products. No Common Facility Centre (CFC) has been established in Bangladesh.	Entrepreneurs agree that their technology is backdated. But say that they do not require modern machinery for the current purpose of work. They cannot afford to buy new machines as they are not certain if investment cost would be recovered.	SMEF	Facilitates loans to purchase machinery, but in a limited amount up to BDT 1 million to each firm.	While both agree on backdated technology, the entrepreneurs do not feel the need of modern technology. It is inferred from their comments that they do not feel urgency of improving quality in design, finishing and performance of products. SMEF is supporting a few institutions by a small amount of loan which is insufficient to buy modern machines.
		BSCIC	No program to upgrade technology	
		BITAC	Has got machines to give production support	
		BEIOA	No program. But can provide guarantee service for firms to take loan for modern machines.	
		EPB	No program	
Lack of Skills: Staff of LE industry do not have relevant formal technical education or training. They learned the technology from hands-on-job training. They do not have design capacity. They lack skill of operating CNC machines. Currently a project is running to impart training of CNC and CAT CAM technology which would train about 120 staff or new recruits in 3 years term. Some staff cannot absorb training of modern technology due to lower level of their merit.	Entrepreneurs do not feel that the staff do not have appropriate skills. They feel that their staff can do the current work skillfully.	SMEF	Some management skills are developed, but few LE members participate	Entrepreneurs are complacent with the skill of workers, because they do not feel importance of new technology, high quality, and operational efficiency where skill matters.
		BSCIC	No program to enhance skills by training or any other way.	
		BITAC	Runs technical training	
		BEIOA	Provides training on modern technology	
		EPB	No program	
Lack of infrastructure: The LE factories operate in small factories having poor utility connections. Nearby roads are narrow. Electricity, gas and water supply and sewerage system is poor. There is no waste treatment facility in the area. There is no LE Industrial Park in the country.	The entrepreneurs do not complain about infrastructure.	SMEF	No project for infrastructure	There are differences of opinion of experts and entrepreneurs. This is because the entrepreneurs are satisfied with repair works currently they are engaged in. They do not have dream of owning a bigger factory, making branded products, and exporting.
		BSCIC	BSCIC Industrial Parks provide plots to LE enterprises in a limited scale. It is going to establish an industrial park that will focus on LE sector.	
		BITAC	No program to develop infrastructure of LE enterprises	
		BEIOA	Has been pursuing for an Industrial Park for long.	
		EPB		

Small scale of operation: Most of the LE enterprises are small in size. These are mostly proprietorships and family owned businesses established for the purpose of livelihood. To supply big orders in the domestic or foreign market large scale production is necessary. Production cost is low for large scale operation.	The entrepreneurs agree that per unit cost product is high due to small scale of operation.	SMEF	No program to increase scale of production	Both agree on disadvantage of small scale of operation. A way out is necessary to be cost competitive. But it requires a lot of investment which they cannot afford and dare.
		BSCIC	No program to increase scale of production	
		BITAC	No program to improve scale of operations of LE enterprises	
		BEIOA	No program Could change mindset to start making for selling.	
		EPB	No program	
Poor quality: The manufacturing industrial buyers seek world class quality of spare parts, tools and other engineering products. The LE industry of Bangladesh lack product quality mainly due to poor quality of raw materials, old technology, unskilled staff and poor designs. The raw materials are collected from scrap metals mainly from ship break which do not have any test report or certification. Metal testing is available only in BITAC and BUET where there are long queues. So, enterprises cannot achieve export quality.	Entrepreneurs agree that for foreign market the quality may not be at up to the mark. But for local market the quality is alright. However, some producers offer lower price by compromising quality which harm reputation of the local LE sector.	SMEF	It organizes Training on management, but not on engineering skills	Both agree that product quality is not up to the mark for export market. Some producers compromise quality by ill practices. Standardization of products could stop ill practices. But urgency of quality is yet to be felt by the entrepreneurs.
		BSCIC	No program to address quality issues, although it has mandate	
		BITAC	Runs technical training , which helps LE enterprises in improving quality of products	
		BEIOA	No program	
		EPB	No program	
Competition with imported spares: Chinese products are cheaper due to large scale production and government subsidy. Some complained that Chinese suppliers initially dump products in the target market at lower prices to capture the market.	There is intense competition with foreign products as well as among domestic producers. It has depressed the price of products, profit margin and market share of good producers. They also mentioned ill practices by suppliers of foreign products.	SMEF	No program to help the enterprises to face competition with imported products or no initiative to policy advocacy to reduce imports.	Both agree on intense competition in the market. Entrepreneurs stress competition from foreign products. This is accepted as a fact that has to be solved by competitiveness. But entrepreneurs are demoralized and feel that they cannot solve the problem.
		BSCIC	No program to help LE firms to face competition with imported products either by improving capacity or by providing protection	
		BITAC	No program to help LE firms to face competition with imported products either by improving capacity or by providing protection	
		BEIOA	No program	
		EPB	No program	
Uncertainty of demand: Import duty on LE products is low in Bangladesh. So foreign LE products enter the market of Bangladesh easily. Like private sector industries public sector corporations are also free to purchase any LE product from open market. This has increased uncertainty of demand for local LE products.	Entrepreneurs say that some producers of LE products are importing foreign products for easy profit. They feel that the customers replace parts than repair. So, demand has decreased for repair and local products. So, they fear to install new machines to expand production capacity, as they might not get expected return.	SMEF	No program or initiative to enhance demand of LE sector products	Entrepreneurs better know about the reason of loss of demand for services of local workshops. There is no difference of opinion. But the owners do not know the reason of uncertainty. It appeared from opinion of both groups that the parts have become cheaper to replace than repair.
		BSCIC	No program to enhance demand. In the past it played the major role in issuing a circular to connect public sector corporations to buy LE products	
		BITAC	No program to enhance demand. In the past it played the major role in issuing a circular to connect public sector corporations to buy LE products	
		BEIOA	No program. Could got the Govt. to reissue the circular of 1987 for mandatory purchase	
		EPB	No program, should create export markets	
Lack of Marketing: LE enterprises of Bangladesh are accustomed to on-demand production. They dislike the hassle of marketing. In contrast, sellers of foreign products aggressively advertise their products.	Entrepreneurs agree that they do not have marketing skill. They do not go to buyers, want buyers to come to them. But they do not care about marketing. They expect that customers would come to them.	SMEF	No program to improve marketing	There is no difference of opinion about lack of marketing by the entrepreneurs. But the entrepreneurs failed to understand the need of marketing.
		BSCIC	No program to develop market linkage or to improve marketing skills.	
		BITAC	No program to develop market linkage or improve marketing skills.	
		BEIOA	No marketing training.	
		EPB		

Lack of policy support: The Government neglected the LE sector in almost all regimes except in 1984 to 1987. Government of that period supplied low interest loans to the LE enterprises to buy machinery. Ministry of Industries issued a circular to promote local LE products in the public sector corporations which owned big manufacturing factories at that time. The circular has become void by Public Procurement Act of 2003 .	The LE entrepreneurs are eager to find a way forward to get out of the trap of cut throat competition with foreign LE products. They expressed dissatisfaction about Government inaction. However, they could not propose specific suggest any specific policy intervention.	SMEF	It does not take initiative for policy advocacy.	Both agree on lack of policy support from Government. But they did not spell out the policy interventions they needed.
		BSCIC	No program to provide policy support on tax, space etc. issues	
		BITAC	No program to provide policy support on tax, space etc. issues.	
		BEIOA	Reason of creation. But does nothing in this regard	
		EPB	No program	
Lack of Finance: The commercial banks of Bangladesh do not consider the LE enterprises bankable as they can rarely meet existing criteria. SME loans do not reach the sector for many reasons. So, LE enterprises do have access to finance.	They are not critical about access to finance. But they are critical of high rate of interest and say that they cannot make profit by investment by taking loan. So, they are not interested in taking bank loans.	SMEF	Provided funds to a small number of LE firms.	There is difference of opinion between experts and entrepreneurs about access to finance. It appears from difference that the rate of return in the LE sector is low that has made rate of interest so important to entrepreneurs.
		BSCIC	No program to help finance the LE firms	
		BITAC	No program to help finance the LE firms	
		BEIOA	No program. Can give guarantee.	
		EPB	No program	

Source: [20]

Table 3:
Comparative Analysis of Expert Perspective and Entrepreneur Perspective on Opportunities of LE Sector and Role of Institutions

Opportunities		Role of Institutions		Gap
Expert Perspective	Entrepreneur Perspective			
Export opportunity: There is a huge market for LE products globally. China, Taiwan, India and Thailand are exporting huge LE products. Bangladesh can avail this opportunity if it can meet product quality.	The entrepreneurs are not confident about capacity to export. So, they do not think that it is an opportunity.	SMEF	No program to export linkage	There are differences in the perspectives of experts and the entrepreneurs. The entrepreneurs do not recognize the opportunity of export.
		BSCIC	No program to make export linkage with foreign customers	
		BITAC	No program to make export linkage with foreign customers	
		BEIOA	Yet to start inspirational training	
		EPB	Has not taken initiative.	
Growth of local industry: There is a huge cement, paper, jute, textile, sugar, food processing, railway, shipping, garments manufacturing sector in Bangladesh which is growing. Currently a large share of spares and machinery are met by imported products although local LE industry produces those products. This market can be served by the local products.	The entrepreneurs say that they are fighting for this market. But due to cheap imports from China and India and dumping they are failing to capture the increased market. They do not have any suggestion for solving this issue.	SMEF	No program to industry linkage	There is no difference of opinion about opportunity. But the entrepreneurs have no idea about how to capture the opportunity.
		BSCIC	There is a list of 1278 LE enterprises which can supply products to local manufacturing sector. But there is no linkage with local industry.	
		BITAC	BITAC has got linkage with local manufacturing industry which it can use to support LE sector to sell products to other industries. But it does not provide this service to the LE sector	
		BEIOA	Has not started linkage program	
		EPB	Its beyond the scope of organizational mandate	
Vibrant banking system: There are about 60 commercial banks in the country which have huge liquid cash. So, financing should not be a problem for LE sector if the linkage is built between two sectors.	Bank is irrelevant to the entrepreneurs as they think the interest rate of commercial banks is unjustifiable for LE sector	SMEF	No linkage is established	There is no difference of opinion about the vibrancy of banking industry. But the entrepreneurs do not feel that the robust banking system is an opportunity for them to capitalize.
		BSCIC	No initiative to make linkage with banking system	
		BITAC	BITAC does not have capacity to make linkage with banking system	
		BEIOA	Has not mediated loans for the enterprises.	

		EPB	As it is not helping the enterprises export the question of arranging loan does not arise.	
TVET Institutes: The government and private sector have established numerous Technical and Vocation Education and Training (TVET) Institutes in the country. These institutes can supply skilled staff to the LE sector that might increase production capability and quality.	The entrepreneurs feel that the educated people would not come to the sector as it is not attractive. So, a linkage between TVET institutions would not bear results.	SMEF	No program to link TVET institutes to supply expert staff	The entrepreneurs and experts disagree on the potentiality of TVET institutes on the competiveness and growth of LE sector.
		BSCIC	No program to link LE sector with TVET institutes to supply expert staff	
		BITAC	BITAC has no initiative to link TVET institutes with LE sector although it provides training to TVET institutes	
		BEIOA	Has linked Daffodil University with the sector	
		EPB	Its beyond the scope of organizational mandate	
Sub-contracting supply: Big manufactures of the world in the industries of automobile, electronics, aircraft manufacturing etc. source components heavily from developing countries like China, India, Malaysia, Thailand etc. Bangladesh, despite having a large LE sector, is not being able to position itself as an outsourcing destination. Bangladesh can become an outsourcing destination for LE products by solving quality, testing and compliance issues.	The entrepreneurs mentioned that TOYOTA, HONDA, came to Bangladesh to explore the possibilities of partnership is supplying parts. But the owners could not prove their capacity mainly due to old technology, quality of raw materials, testing service, standardization of products etc.	SMEF	No program to build linkage or capacity	There is no difference of opinion about the opportunity of sub-contracting supply. But the entrepreneurs feel that they cannot ensure compliance.
		BSCIC	No program to build linkage with foreign purchasers of parts or build capacity to make quality parts for sub-contracting supply order	
		BITAC	BITAC could take an initiative to enhance capacity of LE producers to supply sub-contracting orders. It could make linkage with foreign customers. But it has got no initiative in this regard.	
		BEIOA	Is yet to provide this service as is done by BGMEA/BKMEA for garments	
		EPB	Has not taken initiative although EPB should do it.	
Household demand:. Many household appliances can also be supplied by LE sector. With the growth of economy demand of these goods is increasing. It can provide a new source of demand for LE products.	The entrepreneurs feel that demand is increasing. But the local LE owners are not getting the benefit. Imported products are filling the new gap.	SMEF	No program to boost demand	There is no difference of opinions.
		BSCIC	No program to boost demand	
		BITAC	No program to boost local demand of LE sector products	
		BEIOA	Should find ways to boost local demand. Has not started yet.	
		EPB		
Cluster development: The LE industry of Bangladesh has grown in clusters including in Dhaka, Chittagong and Bogra. So, it is easy to provide supports from limited number of CFCs to be set up only inside clusters.	The entrepreneurs say that Government is not serious about cluster development. BEIOA is not being able to be heard by the Government big shots.	SMEF	Clusters have been identified and documented.	There is no difference of opinions. But the entrepreneurs are less confidant. A donor funded project has been conceptualized recently to set up a CFCs in Dhaka under the leadership of BEIOA. If implemented it would set a model for change of technology in the LE sector of Bangladesh.
		BSCIC	No program of cluster development	
		BITAC	No program for customer development	
		BEIOA	Should be instrumental in bringing the government to the project. Has not succeeded yet.	
		EPB	Has not taken initiative.	

Source: Authors

4. Conclusion and Recommendations

Change of the mindset to shift from repair-based LE enterprises to product-based enterprises is necessary at this

stage. The industries which are customers of LE products are turning to cheap one-time readymade spare parts. Ready-made cheap products have been possible due to new automation and robotics technology. The sector has to shift from just relying on domestic market to export market that can give scale of economies to effectively lower unit costs. This also requires change of mindset of LE entrepreneurs.

To shift from repair-based to product-based, micro-enterprises (with 1-2 machines) may not be a feasible option unless such specialized units are networked with other MSMEs operating in other segment of the value chain in a way that supports a new form of enterprise (which we may call a 'network-enterprise'). Such a business unit has to have all basic machines with current technology required for producing at least one final product. A self-sufficient unit can specialize on a product and increase scale of production as per need in order to reduce unit cost and ensure quality. Such a unit may cost from BDT 10 million to 200 million.

Large scale enterprises are to be set up with modern CNC machinery. Such large scale enterprises with technologically advanced machines can take sub-contracting orders as well as produce branded products. It requires a change of entrepreneurial mindset to switch to bigger scale of operations. Reliance solely on domestic market is to be changed and foreign market is to be explored like Chinese, Taiwanese, Korean, Thai and Indian LE giants. Confidence building measures are necessary through awareness programs, demonstration of success cases and timely institutional support. Besides, international business linkages, outsourcing activities and joint ventures need to be incentivized.

As all machines are costly, most of the units will not be able to afford to establish complete foundry with CNC machines and Heat Treatment plants. Common Facility Centre (CFC) may fill this gap. BITAC can be entrusted to set up, own and operate CFC centers in Dholaikhal area of Dhaka and in other major clusters of the country. BITAC can set up the centre by Government fund or by commercial loans. BITAC has to change the traditional role of training to standardization of LE products and supply of quality raw materials. A change of mindset of the Government body is needed to transform BITAC to a new role. Changes in its law are needed to give BITAC appropriate mandates to undertake the above tasks. Alternatively Government can set up a Light Engineering Development Board (LEDB) to perform above functions for LE sector. BEIOA should be recognized at all levels of policy planning to negotiate with government institutions, foreign buyers and other stakeholders for the interest of LE entrepreneurs.

Over the last 3 decades, the government has defied calls for low interest special loans for the LE sector. Especially large LE enterprises would not be considered for low interest loans. LE sector stakeholders can bargain to allocate a clear quota from SME loans and adjust the criteria for loan application assessment to realities of the sector. Bangladesh bank may issue a special circular for loans for LE MSMEs.

In order for the enterprises to survive and grow, the sector has to attain global competiveness by adopting appropriate technologies, upgrading skill-set, turning to need based products, benchmarking with Chinese, Koreas and Taiwanese LE Enterprises for quality, achieving scale of economies through specialization and fitting into market based financing mechanism.

Government should streamline procurement legislation to enable local industries to buy from LE producers without hassles, redesign duty-tax structure, recommend incentive, decide financing mechanism, provide infrastructure and suggest other policy measures to turn the LE sector from import-substitution to export-oriented industry as the next industry for growth, employment and foreign currency earning.

Further research may be conducted on technology management, product quality assurance, demand dynamics and international trade rules of LE sector which affect competitiveness and growth of the sector.

References

Adhikary, D. & McVay, M. (2006). *Market Development in Practice: Sector Development and Business Services Strategy*. Dhaka: International Finance Corporation (IFC), The World Bank Group.

Ahmed, N. & Bakht, Z. (2010).*Light Engineering Industry in Bangladesh: A Case Stud.* Dhaka: Institute of Development Studies.

Foundation, SMF. (2013). *SME Clusters in Bangladesh.* Dhaka: SME Foundation

INSPIRED, EU. (2013). *Light Engineering Sector*. Dhaka: EU,

Jahan, S.M. (2008).Market Development and SME Competitiveness: Do Government Policies Address SME Challenges? *Journal of Business Administration, Vol. 34(* 1&2),

Kanter, R.M. (2012*).*The Business Ecosystem. *Harvard Magazine, September-October,* LEPBPC. (2016).http://www.bpc.org.bd/lepbpc_current_sector_profile.php

Porter, M.E. (1985).*Competitive Advantage*. New York: Free Press,

Quadir, N. & Mahmud,R. (2009). Technology, Innovation and Collaboration of Firms. *TECH MONITOR*, Jul-Aug, 39-41.

Rabbani, K. S. E. (2005). *Economic Policy Paper on Light Engineering and Electronics Firm in Bangladesh*. Dhaka: DCCI.

Talukder, M.A. & Jahan, S.M. (2016). Light Engineering Business Ecosystem in Bangladesh: A Study on Institutional Preparedness. *IOSR Journal of Business and Management, 18*(12), 16-26

Uddin, K.M. (2009). *Bangladesh's Light Engineering Industry, baseline, profile, performance and plans for upgrading.* Dhaka: SME Foundation.

Uddin,F.& Jahan, S.M. (2017).Demand Dynamics of Light Engineering Sector of Bangladesh and Recommendations for Improvement. *IOSR Journal of Business and Management,* 19(1),

Zikmund, W.G. Carr, J.C., Adhikari, A.& Griffin, M.(2013). *Business Research Methods*, 8e, Delhi: Cengage.

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Table 1: Characteristics of Interviewee Entrepreneurs (Age, No. of Staff & Asset)

Age (in Years)	15-35	36-50	51-75	76 +	Total
No. of Respondents	6	4	6	0	16

No. of Staff	1-9	10-25	26-49	50-100	100+	Total
No. of Respondents	12	2	2			16

Asset (in Million BDT)	0.6-1.0	1.1-1.5	1.6-2.0	2.1-3.0	3.1-4.0	4.1+	Total
No. of Respondents	7	3	1	1		4	16