

**Labor Market Study under Skills for Employment Investment
Program (SEIP)**

LIGHT ENGINEERING SECTOR

Dr. Kazi Iqbal
Md. Nahid Ferdous Pabon
Tanveer Mahmood

Skills for Employment Investment Program (SEIP)

Finance Division, Ministry of Finance

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EXECUTIVE SUMMARY

Light engineering sector in Bangladesh has developed largely as backward linkages to support agriculture, printing and packaging, construction, transport, apparel, cement, paper, jute, textile, sugar, food processing, railway, and shipping sectors by providing industrial machinery and spare parts. While this sector is growing, skill shortage is the main reason to obstruct its potential to upgrade the production processes, technologies and products to the level sophisticated enough to be integrated into the regional value chains. Against this backdrop, this report studies the level of skills of workers engaged in this sector, different types of skill mismatch, extent of training received by the workers, impact of skill gap and shortage, automation and job displacement, soft skill of the workers and the projection of workers demand by occupations. We also carried out the study to find out the impact of Covid-19 on the enterprises and the workers separately.

We began by conceptualizing different types of skill mismatch, drawing on the current literature on skill. The study distinguished between four types of skill mismatch – skill gap, skill shortage, horizontal mismatch and vertical mismatch. To the best of our knowledge, this type of analysis is new to the literature in Bangladesh. Our empirical works on skill mismatch follows from the conceptual framework detailed in the report.

We surveyed 121 light engineering enterprises and 1522 workers. The novelty of the survey is that it is a worker linked enterprise survey – workers are drawn from the enterprises surveyed in a systematic way. We followed the sampling method of World Bank-Bangladesh Enterprise Survey (WBES) for representativeness. While we closely followed the structure of the questionnaire of Survey of Manufacturing Industries (SMI) of BBS and World Bank-Bangladesh Enterprise Survey, a number of internationally reputed survey reports for skill such as the World Bank's Skills toward Employment and Productivity Survey (STEP) were thoroughly reviewed.

Major findings from the enterprise survey

The major findings from the enterprise survey are the following. The first four findings are of the structure of the enterprises while the following five findings are on the skill and skillmismatch. The last four findings dwell on training, automation and job growth.

Five major occupations were categorized in accordance with the Bangladesh Standard Classification of Occupations (BSCO) for better conceptualization – managers, professionals, sales and other service workers, technicians and associate professionals and craftsmen and plant workers, following Bangladesh Standard Classification of Occupations (BSCO). The floor workers (craftsmen and plant workers) dominate the distribution of occupations as out of 3159 workers in our sample enterprises, 2614 of them are craft and plant workers, which is about 83 percent of total employees.

While there are 26 workers per enterprise on average, about 22 of them belong to this

category. This industry is craftsmen heavy with small number of managers and professionals.

Second, the light engineering is a male dominated sector – only 1 percent of the workers are female. Most of the workers are permanent workers – about 98 percent. The craft and plant works, who constitute about 83 percent of the total workers, receive about 12 thousand takaper month. The craftsmen received very subsistence level salary which is slightly above the minimum wages in the RMG sector.

Third, this sector is characterized by very high degree of informality of various dimensions. Only 8 percent of the workers are reported to have formal contract for the jobs. Managers and professionals are the ones with the highest share of formal contract. Only 4 percent of the craft and plant workers have formal contracts.

Fourth, horizontal mismatch captures the discrepancy between the desired field of study by the employers and the actual field of study of the current workers. Overwhelmingly, there is no strong preference for field of study by the employers in the light engineering sector, particularly for the craftsmen. About 82 percent of the enterprises do not have any preferences for the subject studied by the craftsmen. About one-fifth of the managers or owners want to hire workers with science background and this figure is only 1 percent for arts background. Note that horizontal mismatch is relevant only for the workers with higher education where they have a well-defined major of study. About 93 percent of the workers do not have any major either in science, arts or commerce. However, only 2 percent of the workers are with science background. The extent of horizontal mismatch is about 28 percent.

Fifth, the average desired level of education by the enterprises is about 11 years with about 10 years (SSC passed) of education for the craftsmen. On the contrary actual level of education is 7.5 years on average. There is a significant discrepancy here between the desired level and actual level. This discrepancy is known as vertical mismatch. On average, we find staggering 80 percent vertical mismatch for the full sample. There is another kind of vertical mismatch with respect to work experiences. The desired and actual level of experiences at the time of entry are 4.27 and 4.84 respectively on average. Hence, there is no vertical mismatch in this case.

Sixth, hard to fill vacancies are regarded as the skill shortage – enterprises have vacancies but cannot fill them up due to lack of suitable candidates. In the case of craft and plant workers, about 80 percent of the firms opined that they could hire workers in less than a month. The figures by occupations indicate that craftsmen are not very hard to find from the market. Competition from other enterprises has not been regarded as a major threat to hire workers. Managers, professionals and sales related workers are relatively hard to recruit as it takes more than a month in more than half of the cases.

Seventh, in order to understand the gap between the desired level and actual level of proficiency to perform a job by the workers, we asked the managers/owners to scale the level of proficiency of the workers on a 1-10 scale with higher number signifying higher proficiency. The average level of proficiency is 6.94 for all workers. Interestingly, craft workers and machine operators have the lowest score – 6.64, compared to other occupations. Hence the extent of gap is about 3.36 in 1 to 10 scale which can be interpreted as 33.6 percent skill gap.

Eighth, overall impact of skill gap and skill shortage has been reported to be moderate. Skill shortage in sales related workers are largely held responsible for the moderate impact of delay in developing quality products. Skill shortage has not been found to push firms to outsource works much. However, some withdrawal of products due to skill shortage has been reported.

Ninth, the enterprises reported that they would address the problem of skill gap and shortage by increasing the number of trainings and the salary of the workers to attract more skilled labor.

Tenth, the incidence of training received by the workers is extremely low. Only 2.3 percent of the workers received training in the last three years before the interview. Of the trainings, about two-thirds are conducted by external trainees outside factory premises.

About 38 percent of the trainings were 1-2 week long trainings. All 121 enterprises together spent only Taka 9200 in the last three years on the training of the workers.

Eleventh, the industry-TVET linkages has been found to be very low. The share of workers with TVET training is only 1.58 percent of the total workers.

Twelfth, regarding automation and job displacement, we asked to scale the extent of automation a particular occupation may experience in the next 5 to 10 years on a 1-10 scale. On an average the score is 5.58. This indicates that the enterprises did not perceive automation as a threat to consider in the next 5 to 10 years.

Thirteenth, regarding projection of occupations by 2030, the expected growth of the total workers is about 145 percent, with more than 13 percent annual growth. It appears that the longer term outlook is better, as projected by the firms. Sales related workers are expected to grow more than other occupations in the light engineering sector.

Major findings from the worker survey

The major findings from the worker survey are the following.

First, formal education is an important ingredient for skill formation. Hence we discuss the level of education of the workers at length. We find that overall level of education of the workers of the light engineering is very low, including the managers and professionals. This indicates that as the craft and plant operators largely have primary level education, they may

not be the right target group for any sophisticated trainings which demand higher level of basic education. The craft workers and plant operators not only have lower level education, their results (GPA) are also worse than other occupation groups.

Second, only less than 5 percent workers are from vocational (TVET) stream and about 10 percent are from madrasa. About 16 percent of the workers passed the SSC examinations; percent of the workers have the HSC degree and only 2.5 percent have bachelor degree. Only 42 workers out of 1522 (2.76%) have diploma degree.

Third, as we found in the enterprise survey, only 8.3 percent have ever attended any vocational training in our worker sample. About three-fourth trainings were arranged and financed by the NGOs, private sector and government; the rest is arranged by the employers.

Fourth, there is a huge need for training particularly on sophisticated measurement techniques, auto-molding methods, CNC operation, cutting and fitting, precision welding, quality control, machine maintenance, etc.

Fifth, the floor workers such as craft workers and plant operators largely disagree that formal education helps in performance in their jobs. However, the managers and service and sales workers think formal education is important for their performance.

Sixth, overall reported satisfaction level with the jobs has been found to be higher for the professionals and technicians and associate professionals than other occupations. This is lowest for the service and sales workers and this comes largely from the inadequate salary. Sales workers are also not satisfied with the job prospects.

Seventh, using standard measures for eliciting five aspects of non-cognitive ability-extroversion, agreeableness, conscientiousness, neuroticism, openness to experience, we find that the soft skills are more than the mid-point on a 1-15 scale. The workers also possess soft skills and they think these are also important for team work.

Major findings from the survey on the impact on COVID-19

Major findings from the module on the impact of COVID-19 on the enterprises and the works are the following.

First, in order to capture the impact of COVID-19 in 2000, we collected information for three quarters: January-March, April-June and July-September. Compared to this pre-covid period, total output per enterprise dropped drastically by 60 percent. Overall, the firms were downsized by 12 percent in April-June 2020 compared to the past quarter. Though the full sample shows the full recovery in terms of output, the impact varies with the size of the firms. The smaller firms are worse off due to COVID-19.

Second, we also interviewed the workers to assess the impact of COVID-19. Among all the occupations, the floor workers experienced the largest drop of full employment in April –

about 75 percent. The situation improved drastically from June and reached almost pre-Covid level in August. Salary of the workers almost halved in April and then gradually increased. 23 percent of the craft and plant workers went back to villages during lockdown months. A small fraction of the workers did not return to work until September.

Key recommendations

This report offers three types of recommendations - general recommendations for the improvement of the skills of the workers, sector specific recommendations and the recommendations for designing the second phase of SEIP.

General recommendations for national skill development

- i. Broader definition of skill is required in national plan.
- ii. It has to be recognized that skill acquisition is a life-long learning.
- iii. Clear understanding of how and when skill is formed is required by the policy makers to identify the point of entry of policy intervention. This understanding is essential for the developing countries as it is argued that skill is largely formed through learning by doing at the factories producing low-end goods. Schooling and training play little role in forming skills.
- iv. Alignment of education and skill development policies with industrial policy and long-term plans is required for a holistic approach of skill development.
- v. Sector Wide Approach (SWAp) is required for secondary education and TVET together.
- vi. Easily accessible information for all on skill development opportunities is a must for more inclusive skill development strategy.
- vii. Greater social recognition for vocational education is required. Social stigma related to vocational education needs to be removed.
- viii. Regular and high frequency data is required to track sector specific skills and skill mismatch.

Sector specific recommendations

- i. Greater access to finance to acquire new technology and training for the private sector is essential.
- ii. Understanding of why most enterprises do not arrange any formal training for the workers is needed.
- iii. Industry leaders suggest to create Common Facilities Centers (CFCs) for industry clusters which will include training facilities.
- iv. Industry-TVET linkage through an implementable framework is essential.
- v. Greater access to institutional training with certification for all technical workers requires to be ensured.

vi. Preparation for embracing 4IR needs to be started right away.

Recommendations for SEIP for designing the second phase

vii. Greater focus is needed on mid-level to advanced courses. The market failure is more in the case of higher-level trainings.

viii. Right combination of technical vs. management trainings has to be ensured.

ix. Soft skills for the workers should be included in the curricula.

x. Technical institutes should be the prime vehicle for delivery of trainings through strengthening the current institutes.

xi. Right combination for fresh trainees to go through off-job training and on-job training need to be thought through and ensured.

xii. Partnership between institute and large individual industries should be fostered as they lie on the technological frontier in the country.

xiii. Ranking of training institutions can ensure competition among them which in turn will lead to quality improvement of the training. This will also help potential trainees to learn about the quality of the training institutes.

xiv. Offering scholarships, on top of tuition waivers, to the trainees can incentivize the potential students.

xv. Demand side interventions such as mass campaigns highlighting the benefits of vocational education and training are required to create demand for such stream.

xvi. Partnering with international training institutions can ensure quality and accreditation.

CHAPTER 1: INTRODUCTION

1.1 Background

Bangladesh has made a remarkable success in achieving steady and persistent acceleration of growth over the last few decades, with about one percentage point increase in every decade since the 1980s. Average real GDP growth over the last five years has been above

6.5 percent, which is much higher than the average growth rate of all developing countries (4.7 percent). Recently, in the beginning of FY2015-16 per capita income of Bangladesh has crossed the threshold of USD 1,046 to become a lower-middle income country. According to the Bangladesh Bureau of Statistics (BBS), per capita income is estimated at US\$ \$1,751 in FY2017-18. The economy now aspires to attain the high middle-income status by 2030, and developed country status by 2041. To this end, in addition to factor accumulation (capital and labor), the economy requires to upgrade the skill base of the labor force to enhance the productivity.

It is argued that the contribution of productivity in the production process has been very low in Bangladesh. Almost 99 percent of the growth has been contributed by the accumulation of factors. The risk of growth relying solely on factor accumulation is that at one stage the diminishing marginal return of factors set in, which ultimately leads to a stagnation of growth. Though Bangladesh may be away from reaching the point of diminishing return, the country should consider improving the productivity of the labor force in order to maintain the high growth now and also to avoid 'middle income trap' in future.

The low level of skills and productivity of the Bangladeshi labor is endemic, as indicated by labor force survey data that more than 60% of the labor force has either no education (40%) or only up to primary level (23%). With the approval of the National Education Policy (NEP), 2010 and the National Skill Development Policy (NSDP), 2011, the government embarked on major education and training reforms. In 2014 the government of Bangladesh has initiated the Skills for Employment Investment Program (SEIP), a multi-tranche financing facility supported by the Asian Development Bank (ADB) and Swiss Agency for Development and Cooperation (SDC), anchored in the National Skills Development Policy (NSDP), 2011. Under first and second Tranches, 223,000 have been trained and certified with a job placement rate of nearly 70 percent. The combined training target under the first two Tranches is 502,000. Female participation among trainees is more than 30 percent.

SEIP has been conducting trainings on light engineering related trades partnering with Bangladesh Engineering Industry Owners' Association (BEIOA) and Bangladesh Industrial Technical Assistance Center (BITAC). So far, tranches 1 and 2 trained 24850 persons on different trades of light engineering, of which 19931 trainees already received jobs (Table I). The detailed information of the trainings is provided in the appendix.

Table 1: Training on light engineering by SEIP

Associations/institute	Trench	Total target	Enrollment	Female	Certification	Job Placement
Bangladesh Engineering Industry Owners' Association (BEIOA)	1	8340	8354	94	8185	6933
Bangladesh Industrial Technical Assistance Center (BITAC)	2	10660	10675	726	10234	8949
	1	3240	3275	438	2894	2326
	2	2520	2555	400	2234	1723
Total		24760	24859	1658	23547	19931

Source: <https://seip-fd.gov.bd/statistics/>

In this backdrop, SEIP of Ministry of Finance has requested BIDS to conduct a study of the labor market for Skill for Employment Investment Project (SEIP). The scope of this study is beyond the interventions of SEIP. The focus of this report is on the level of skill of the workers in the light engineering sector, different types of skill mismatch, extent of training received by the workers, automation and job displacement, soft skill of the workers and the projection of workers demand by occupations.

This study on light engineering is one of the sectors under component 3.

1.2 Objective of the Study

- I. The main objective of assignment is to analyze labor supply and demand over the next 10-year period (2020-2030) in order to assist the government and the private industry to better plan the capacity and quality of skills training systems according to the evolving skills/trade/market demands from rapidly growing industry sectors.
- II. The second objective of the assignment is to determine sector priorities, assess skills gap by sector, analyze sector-wise occupational composition of employment (including gender composition of employment), assess occupation-wise training requirement by sector and trade.

1.3 Overview of the Sector

Light engineering sector is considered as one of the thrust sectors of the economy which is believed to help industrialize the economy beyond the apparel sector. Light engineering has been announced as the product of the year 2020 to underscore its importance for enhancing economic growth and creating decent employment.

1.4 Size of the sector

Light engineering sector in Bangladesh has developed largely as a backward linkages to supply industrial machineries and spare-parts to agriculture, printing and packaging, construction, transport, apparel, cement, paper, jute, textile, sugar, food processing, railway, and shipping sectors. This sector is claimed to produce around 10,000 different types of items. The products produced by this sector can be divided into two broad categories - final products and intermediate products. The final products include bicycles, switches, sockets, toys, grills, etc. On the other hand, intermediate goods include a wide

variety of products for other industries which are listed below.

According to Price Waterhouse Coopers, the size of the market was about USD 12 billion in 2018. The local production is argued to meet about half of the demand. This industry comprises of about 40,000 small to medium sized enterprises, employing about 6 lakhs workers. There are 34 registered light engineering clusters in 18 districts in the country.

The types of products vary with clusters – clusters located in Rangpur–Dinajpur produce spare parts for automobiles, railways, mills, factories and maintenance work. On the other hand, Bogra and Natore’s clusters produce foundry, agro-machinery, factory spares, LPC, cylinders and maintenance work. Light engineering clusters in Sylhet produce spare parts for mills and factories. The Dhaka-Gazipur-Narayanganj based clusters largely produce capital machinery, bicycles, construction equipment and spare parts. Clusters in Khulna- Barisal produce spare parts of mills, factories and industries; and the Chittagong clusters produce largely breaking activities, spare parts for automobiles and maintenance work.

1.4.1 Major intermediate products for other industries

I. Construction sector

Mixture machine, piling machine, construction crane, soil molding machine, auto bricks manufacturing machine, brick crusher, stone crusher, concrete mixer machine, vibrator machine.

II. Automobile sector

Spring, break drum, bush, pulley, piston ring, gijon pin, gijon 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 and motor cycle paddle.

III. Paper and pulp sector

Manual knife, gate valve, agitator, pneumatic valve, compressor pump, gear coupling, felt roll, helical gear, spur gear, herringbone gear, compressor, roller, pump and cutter.

IV. 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.

V. Mold and die sector

Industrial parts, egg tray, garment hanger, water filter, cookeries, plastic bottle,

cosmetic, toy, sanitary and shoe.

VI. Railway sector

Center p-boat, brake bim, brake shaft, CI coupling, brake hamper, rail channel pin and cable, bearing, elbow, mini-puli, bolt, cylinder liner, piston, compressor, S.P. cylinder, hanger and horn.

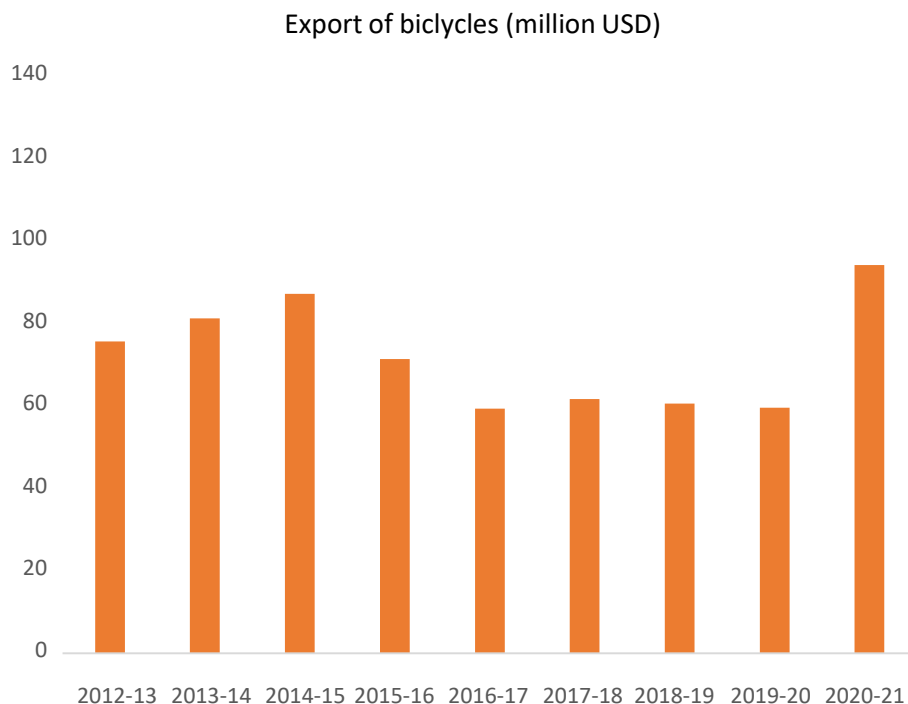
VII. Marine sector

Marine popular shaft, sugan bush, sugan, head, head valve, ring, fiver bush, machine tools, lathe machine, power press, shaper, hydraulic press, cooling tower, etc.

1.4.2 Large players: Bicycles

The manufacturers of bicycles are the largest players in this sector. According to the Bangladesh Bicycle Merchant Assembling and Importers Association, the local market demand for bicycles is estimated at Tk 1,200 crore, which is growing exponentially overtime. Manufacturers exported bicycles worth around \$130 million in the financial year 2020-21, which is 50 per cent higher than that of the previous year, according to the Export Promotion Bureau. Now, there are three major exporters in the bicycle industry with Meghna Group being the largest. Pran-RFL Group also exports its bicycles under the brand name Duranta Bikes. Pran-RFL is relatively new in the market which started its business in 2015. The other major exporter is Alita Bangladesh, which is a Taiwan-based company in the Chittagong Export Processing Zone.

Figure 1: Export of bicycles



1.4.3 Exports

According to the Export Promotion Bureau (EPB), the Bangladeshi small and medium scale manufacturers exported US\$529 million worth of engineering goods in the FY 2020-2021, posting an 80.60 per cent growth year on year. In the previous FY2020, the export of engineering products fetched \$292.92 million.

Bicycle exports rebounded strongly in 200-21 and saw the largest exports in a fiscal year (USD 131 million). See Figure 1 above.

CHAPTER 2: CONCEPTUAL ISSUES ON SKILL

This brief concept note will help sharpen our understanding of various issues, forms and measurement of skill mismatch which are used in this report.

2.1 Soft vs. Hard skill

Soft skill includes non-cognitive abilities or personality traits such as teamwork, communication, work ethic, time management, work under pressure, etc. While there is an increasing evidence on the high return of soft skills, we touch soft skill only tangentially in this study. Our study focuses on hard skill largely which includes specific skills to perform a specific job.

2.2 Skill Mismatch

Skill mismatch refers to various types of imbalances between skills offered and skills needed in the labor market. The broad concept of skill mismatch can assume different forms, such as vertical mismatch (over-education and under-education), horizontal mismatch (field of study), skill gaps, skill shortages and skill obsolescence. Skill mismatch, in all of its forms, is a major source of labor underutilization. For example, if workers in a firm are overeducated than is actually required for the particular job they are working in, this means that the firm is wasting a part of labor productivity which, if skill had matched perfectly, could have been used to generate a higher level of output. Similarly, under-education means that the firm is not operating at its full potential, losing a part of output which could have been gained in the absence of the mismatch. All labor market actors, e.g. the government, corporations and workers need to ensure that the appropriate skill gets employed at the appropriate job in order to shape labor market outcomes which leads to higher growth, productivity and competitiveness (ILO 2014). In developing countries, the first order problem is skill shortage and skill gap – there are not enough skilled workers available and if available they do not possess the required level of skill. In the following sections we will briefly discuss various forms of skill mismatch and how to measure them.

2.3 Forms of Skill Mismatch

Skill Gap

Skill gap is a firm-level measure of skill mismatch based on employer's perception about the ability of employees. It measures the degree to which workers lack adequate competencies to successfully perform their current duties at job. This type of skill mismatch may cause lower output per worker, increase labor cost, incur additional costs on recruitment and training and adversely affect firm-level profitability.

Skill Shortage

Skill shortage refers to a situation where employers cannot find suitable candidates with certain skills to fill job vacancies. Situations like this are characterized by market conditions where the demand for skills by employers cannot be met by the available supply at the equilibrium wage rates. An important feature of this firm-level measure is that it is directly linked with skill gap; whenever firms find it hard to fill vacancies due to

lack of a particular skill-group, they are forced to recruit inadequately skilled workers into those positions

Over-education and Under-education

Measured at the level of individual's circumstances, over-education and under-education refer to the degree to which workers' education levels are above, below or poorly matched to those required for their current jobs. In case of job vacancies, the measure relates to the degree to which applicants' education level meet the hiring requirements. This is also known as vertical mismatch.

Horizontal Mismatch

Horizontal Mismatch refers to situations where workers get employed in jobs that are neither related to their education, nor to their skills and knowledge. The measure identifies any mismatch between the workers' primary field of study and the skill actually required for their current jobs.

2.4 Measurement Issues of Skill Mismatch

Skill Gap

Skill Gaps are typically measured from information perceived by the employer on skill insufficiencies among the workers in a firm. However, similar perception-based information are also collected from the employees themselves on their skills and expertise. For example, we can ask for responses in a scale from 1 (not at all) to 5 (to a very high extent) to the question: "To what extent does this work require more knowledge and skills than you can actually offer" with 4 and 5 denoting skill gap. It is found in the literature that employees tend to over-report skill gap compared to employers, maybe because, while responding to questions on skill gap, the former are more likely to consider future career requirements, rather than immediate job requirements (McGuinness and Ortiz 2016).

Skill Shortage

Surveys aiming to measure skill shortage generally involve asking two separate sets of question to employers, with one trying to establish the existence of unfilled or hard-to-fill vacancies and the other trying to gather information on the reasons underlying any recruitment difficulties. There are, however, some sources of bias in the estimate coming out of employers' responses. Employers tend to inflate the true magnitude of recruitment difficulties by adding to it their inability to offer necessary salary, working conditions to attract workers with relevant skills (Cedefop 2015).

Over-education and Under-education

There are three approaches in literature to measure over-education and under-education, namely subjective method, realized matches method and job evaluation method. The first two are the most commonly used methods in the literature. Each method has its own advantages and disadvantages and estimates from the three approaches might differ and produce conflicting results.

The subjective method collects a worker's self-assessed responses to questions "what are the level of qualifications required 'to get' or 'to do' your current job" and "what is the highest level of qualification you have". These responses are then compared to determine if the worker is overeducated (level of education higher than that is required), undereducated (level of education lower than that is required) or matched (level of education equal to the requirement). Variables denoting over-education and under-education might take both the forms of binary dummy and the years of over-education and under-education. The

subjective method is relatively easier to apply in survey data. However, this method cannot be retrospectively applied to existing data and the method is prone to subjective bias.

The realized matching method or the empirical method estimates the mean or mode value of educational requirement for a particular job and compares it with each worker's education level. The greatest advantage of this method is that it is applicable to existing micro datasets, such as national labor force survey, containing information on educational qualifications and occupation, hence facilitates cross-country comparisons. One of the disadvantages of the realized method is that instead of actual skill requirements, it takes an average measure of qualifications of all workers. Therefore the method less closely captures the required education level "to do a job" compared to that of "to get a job".

Another drawback of the method is that due to limited sample size, it can only capture skill mismatch for broad occupational groups (e.g. health professionals), not at a disaggregated level for individual job title (e.g. nurse).

The job evaluation method uses the field expertise of professional job analysts to measure the educational requirements for different occupations. This approach is less prone to subjective bias as it uses specialized knowledge on the particular field and hence more accurate compared to the other methods.

Horizontal Mismatch

Measuring horizontal mismatch involves asking workers to assess the relevance of their current job with their field of study and expertise. Some studies measured the mismatch independently by comparing a field of study variable with occupation codes (Robst 2007 and 2008 and Allen and de Weert 2007).

CHAPTER 3: APPROACH AND METHODOLOGY

3.1 Sampling Strategy and Sample Size

Following World Bank-Bangladesh Enterprise Survey (WBES) 2013 method, we estimated the sample size and conduct the survey. Once the total sample is selected, we will stratify them in size and geographical concentration. We took the help of the local business associations to locate the enterprises.

The sampling formula of the World Bank's Enterprise Survey is given by

$$n = \left[\frac{1}{N} + \frac{N-1}{N} \frac{1}{PQ} \left(\frac{K}{Z_{1-\frac{\alpha}{2}}} \right)^2 \right]^{-1}$$

Where,

n= sample size

N= population size

P= population proportion

Q= 1-P

K= desired level of precision

$Z_{1-\frac{\alpha}{2}}$ = The value of the normal standard coordinate for the desired level of confidence

1- α . Following WBES, we assume k = 7.5%, $\alpha=10\%$, and P=0.5 for all sectors

According to The Bangladesh Engineering Industry Owners Association (BEIOA), there are currently 40,000 light engineering enterprises in the country, though only a small fraction of them is registered. These enterprises are scattered around Bangladesh and it is difficult to get their list/addresses. There is no published and unpublished source of information that can be used as a sampling frame for the light engineering enterprises study. We therefore drew a sample from 4,000 members registered with the Bangladesh Engineering Industry Owners Association (BEIOA). We surveyed 121 enterprises following the formula used by WBES.

3.2 Questionnaire Design

Two standardized questionnaires are used – one for enterprise and the other for employees. We closely followed the structure of the questionnaire of Survey of Manufacturing Industries (SMI) of BBS and World Bank-Bangladesh Enterprise Survey (WBES) 2013 for the basic variables of enterprises such output, inputs (land, labor, capital, and raw materials), technology, financing, and markets (input and output). We will have separate modules to capture different forms of skill mismatch discussed above. We particularly took help of the following surveys conducted in other countries, for both enterprises and employees.

The World Bank's Skills Toward Employment and Productivity Survey (STEP)

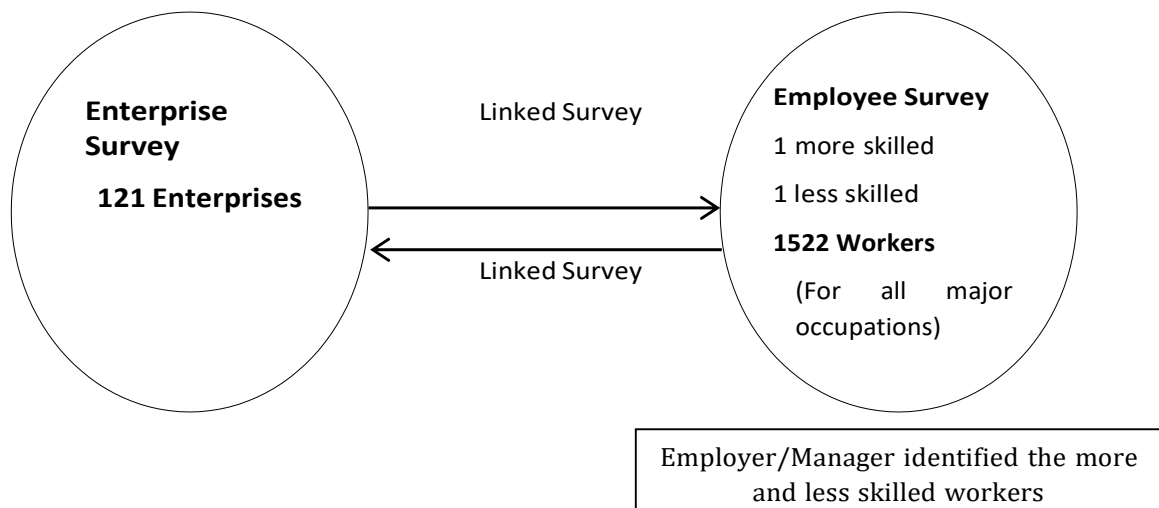
- The ILO's School to Work Transition Survey (SWTS)
- Cedefop's European Skills and Jobs survey (ESJS)
- OECD's Survey of Adult Skills (PIAAC)
- Reflex Project¹

¹ The Reflex project is a large-scale European survey of education on graduates. The fifteen participating countries are Austria, Finland, France, Germany, Italy, the Netherlands, Norway, Spain, the UK, Czech Republic, Portugal, Switzerland, Japan, Estonia and Belgium-Flanders.

3.3 Linked worker survey

We conducted a linked survey – enterprise linked worker survey. The purpose of the survey is to understand the skill production function of the workers – what are the factors that help form skill? This understanding is essential because this will inform policy makers about the factors to promote to upgrade skills.

We picked two employees from each occupation/task with the consultation of the manager in such a way that one is relatively more skilled one and the other is the less skilled in manager's view since the manager/employer knows best about the level of skill of his or her workers. Following this method, we survey, 1522 workers from 121 enterprises, about 12.6 workers per enterprise.



3.4 Scope of Survey: Regions and Products

In order to capture the regional distribution of the enterprises and the variety of products they produce, we followed Economic Census 2013 closely. The following Table 1 highlights how sample is distributed across regions and products. We concentrated on four major clusters of light engineering firms – Bogura/Natore, Chittagong, Dhaka/Gazipur/Narayangonj, and Jessore/Khulna/Jhenaidah. The range of products we considered to include capital machinery (full machines), construction equipment, spare parts of automobile, factories and agro-processing, bodies for bus, van, etc., bicycles and others.

Table 1: Region and product wise distribution of sample

Region	No. of enterprise	Capital machinery (full machine)	Construction equipment	Spare parts for automobiles/ factories/ agro-processing	Body for bus, car, van, others	Others
Bogura, Natore	35	12	4	13	0	6
Chittagong	20	5	3	7	0	5
Dhaka, Gazipur, Narayangonj	49	13	9	15	0	13
Jessore, Khulna, Jhenaidah	16	5	2	0	7	2
Total	121	35	18	35	7	26

CHAPTER 4: FINDINGS FROM ENTERPRISE SURVEYS

4.1 Structure of enterprises and employment

Table 2: Structure of the enterprises

	Large	Medium	Small	Full sample
No. of enterprises	43	34	44	121
Total Employment	1858	688	613	3,159
Employment per enterprise	43.21	20.24	13.93	26.11
Output per enterprise (Million Taka)	83	21	15	41
Capital stock per enterprise (Million Taka)	48	8	6	21
Capital-labor ratio per enterprise (Thousand Taka)	29	13	9	17

We divided all enterprises into three groups according to the size (employment). Enterprises with 1 to 14 workers are the small enterprises, 15 to 20 are medium enterprises and 21 and above are large enterprises. In our sample, 43 enterprises are large, 34 enterprises are medium and 44 are small. These 121 enterprises employ 3159 workers, about 26 workers per enterprise. In the case of large, medium and small enterprises, employment per enterprise are 43, 20 and 14 respectively. Average total output is 41 million Taka with large enterprises producing 83 million Taka, medium 21 million Taka and small 15 million Taka. As expected, capital stock is also higher for the larger enterprises – 48 million Taka, whereas the average is 21 million taka for all enterprises. Average capital-labor ratio is 17 million Taka and larger firms are more capital intensive than the small and medium ones. However, it is interesting to note that there is not much difference between the small and medium firms in terms of capital-labor ratio.

Table 3: Structure of employment

Occupation	Total Employment	Employment per enterprise	Monthly avg. salary (Taka)	Share of female workers (%)	Share of permanent workers (%)	Share of fulltime workers (%)
Manager	183	1.51	29,446	0.02	0.99	0.97
Professional	32	0.26	17,768	0.03	1.00	0.97
Sales and clerk	90	0.74	11,647	0.01	0.97	0.96
Technician	240	1.98	17,766	0.00	1.00	0.99
Craft and others	2,614	21.60	12,095	0.01	0.96	0.96
Full sample	3,159	26.11	17,744	0.01	0.98	0.97

Since the objective of our work is to understand the level of skill and skill mismatch, it is imperative to shed some light on the structure of the employment and the extent of formality. We also categorize the occupations in five major categories for better conceptualization – managers, professionals, sales and other service workers,

technicians and associate professionals and craftsmen and plant workers. The definition of each category with example is provided in Table 21. As we see in Table 3, in the light engineering sector, the major occupation is the craft and plant workers. Out of 3159 workers in our sample enterprises, 2614 of them are craft and plant workers, which is about 83 percent of total employees. While there are 26 workers per enterprise on average, about 22 of them belong to this category. There are about 2 technicians and associate professionals, and about 1 sales worker in an enterprise. This sector does not employ many professionals – only one professional in four enterprises. There are about 1.5 persons per enterprise working as managers.

The average monthly salary of all workers is Taka 17,744. The manager is the highest paid occupation as they received about 29.5 thousand taka. There is not much difference in salary between the professionals and associate professionals. They both received about 17.8 thousand taka. The sales related workers are the least paid – their salary is about 11.6 thousand taka. The craft and plant workers, who constitute about 83 percent of the total workers, receive about 12 thousand taka per month.

The light engineering is a male dominated sector – only 1 percent of the workers are female. Most of the workers are permanent workers - 98 percent. 97 percent of the workers are full time workers.

4.2 Extent of Formality

Table 4: Extent of formality

Occupation	Total employment	Share of workers with paid overtime (%)	Share of permanent workers with written contract (%)	Share of workers with weekly paid leave (%)	Share of workers with paid sick leave (%)	Share of workers with monthly paid leave (%)
Manager	183	96.00	0.49	0.76	0.69	0.57
Professional	32	100.00	0.69	0.59	0.59	0.50
Sales and clerk	90	95.00	0.13	0.51	0.48	0.34
Technician	240	99.38	0.13	0.48	0.43	0.28
Craft and others	2,614	99.28	0.04	0.31	0.26	0.19
Full sample	3,159	97.93	0.08	0.36	0.31	0.23

The Table 4 is about the extent of formality of the workers. It is reported that about 98 percent of the workers work overtime and they are paid for it. Of the total workers, only 8 percent are reported to have formal contract of the jobs. Managers and professionals are the ones with the highest share of occupations with formal contracts – about half of the managers and 70 percent of the professionals have formal contracts. Only 4 percent of the craft and plant workers have formal contracts. This figure is 13 percent for both sales related workers and associate professionals. 36 percent of the workers enjoy

weekly paid leave – this share is the highest for the professionals (76 percent) and the lowest for the craft and plant workers (31 percent). About 50 to 60 percent of the workers of other professions are entitled of weekly paid leave. 31 percent of the workers are reported to receive paid sick leave. This share is only 26 percent for the craft and plant workers. For other occupations, the percentage varies from 43 to 69 percent. 23 percent of the workers receive monthly paid leave. Similar to other paid leave, craft and plant workers enjoy the lowest and managers get the highest.

4.3 Skill mismatch: Horizontal and Vertical

In section 2, we detailed out the concept of horizontal and vertical mismatch. In short, horizontal mismatch captures the discrepancy between the desired field of study by the employers and the actual field of study of the current workers. On the other hand, vertical mismatch captures the mismatch between the desired level of education (years of schooling) by the employers and the actual level of education of the workers. When desired level is higher than the actual, we call it under-education and when desired level is lower than the actual, it is over-education. Table 5 describes the desired field and level of education while Table 6 shows the actual level of the current workers. We calculate the discrepancy between these two and report the horizontal and vertical mismatch in Table 7.

Table 5: Desired level of qualification of the workers

Occupation	Total Emp.	Desired qualification (science) (%)	Desired qualification (Arts) (%)	Desired qualification (Commerce) (%)	No preference for field of education (%)	Desired level of education (Years) (%)	Desired level of experience at entry (Years)
Manager	183	0.21	0.07	0.45	0.27	14.1	5.22
Professional	32	0.11	0.00	0.84	0.05	14.1	4.37
Sales and clerk	90	0.04	0.04	0.15	0.76	9.7	3.28
Technician	240	0.43	0.01	0.04	0.53	10.9	4.93
Craft and others	2,614	0.17	0.00	0.01	0.82	9.6	3.53
Full sample	3,159	0.19	0.01	0.08	0.71	10.4	4.27

Table 5 shows the desired field and level of education, as well as experience of the workers at the entry level by the employers. We use four types of employers' preference towards the field of study- science, arts, commerce and no choice. 19 percent of the owners want workers from science background. This percentage is the highest for the associate professionals and technicians. The preference for science is not high for the crafts and plant workers – only 17 percent. This is very low for the professionals as well (11 percent). There is no particular preferences for arts background – overall only 1 percent of the enterprises want workers with such field of studies, with 7 percent for managers and 4

percent for sales related workers. The demand for workers with commerce background is the highest for the professionals – 84 percent, followed by managers (45 percent). However, overwhelmingly, there is no strong preference for field of study by the employers in the light engineering sector. 71 percent of the employers think that they are indifferent about the field of study of the workers. This percentage is the highest for the craft and plant workers. This suggests that learning by doing through on-job training is the major way of skilling the workers which requires little academic learning. 76 percent of the owners are indifferent about sales related workers’ field of study and this figure is 53 percent for the associate professionals and technicians. Note that, the field of study matters only for those who passed at least SSC or equivalent examinations.

On average, desired level of education is only about grade 10 for all workers. The employers demand SSC or equivalent level of education for the craft and plant workers. This figure is slightly higher for associate professionals and technicians. Sales related workers are expected to have similar level of education. The desired level of education of the professional and managers are about 14 years. That is, these two professions are expected to have education beyond higher secondary level.

There is a demand of experience of the employees at the entry level. On average, employers want about 4.27 years of experience. This is highest for the managers – 5.22 years. Employers desire more years of experience in associate professionals (4.93) than in the craft and plant works (3.53). The desired level of experience for the sales related workers is 3.28 years.

Table A1 of the appendix section depicts the detailed occupation-wise desired level of qualification at the entry-level by the employers. From the table, it is apparent that for the technical jobs there is a specific preference of subject e.g. employees from Science background are preferred for the technician or computer operator posts. However, for most of the production floor workers like Machine operators, Welders, Fitter etc. there is no specific preference for a subject. As discussed earlier, in these professions in-job learning is often more prioritized over their educational background. This is also reflected in the desired level of experience at entry-level. For the occupations such as welders, fitters, CNC machine operators, although the desired level of education is around 10 years (SSC passed), the average entry-level experience is 3.88 years. We see similar figures for the professions like power press, Hydraulic press operators. For managerial level positions at least an undergraduate degree is expected.

Table 6: Actual qualification

Occupation	Total Employment	Average qualification level (Science)	Average qualification level (Arts)	Average qualification level (Commerce)	Average qualification level (None)	Years of education	Average years of experience at the entry level
Manager	183	0.19	0.39	0.21	0.22	12.4	5.56
Professional	32	0.15	0.11	0.53	0.21	12.5	5.05

Sales and clerk	90	0.04	0.2	0.07	0.7	7.9	3.89
Technician	240	0.06	0.15	0.01	0.78	8.1	5.42
Craft and others	2,614	0.01	0.03	0.01	0.95	6.4	4.26
Full sample	3,159	0.02	0.03	0.02	0.93	7.5	4.84

Table 6 takes stock of the current level of education, field of study and years of experiences for the light engineering sector. 93 percent of the workers do not have any field of study, largely due to their low level of education. Managers are mostly of arts background - 39 percent of the managers are from arts; 21 percent are from commerce and 19 percent from arts. Professionals are mostly from commerce background (53 percent). 15 and 11 percent of them are from science and arts respectively. Most of the sales related workers do not have any field specific education (70 percent), with 20 percent from arts. 78 percent of the associate professionals and technicians also have no field of study; only 15 percent are from arts. Similarly, among the craft and plant workers, 95 percent are with no subject specific background.

Average years of schooling for the full sample is 7.5 years. Managers have 12.4 years and professionals have 12.5 years of schooling. For all other professions, average is about 8 years and below. Craft and plant workers have only 6.4 years of education. Associate professionals and sales related workers have 8 years of education.

The average years of experience of the workers is 4.84 years. Craft and plant workers have 4.26 years of experiences on average and sales workers have 3.89 years. Average years of experiences are between 5.05 to 5.56 years for other occupations.

Table A2 depicts the detailed occupation-wise actual qualification of the workers of this sector. One notable thing is a mismatch between the desired qualification and actual qualification in terms of the subjects studied by the workers. For example, 37.5 percent of the accountants are not from the commerce background. This horizontal mismatch of skill will be discussed in the next section. Another notable thing is many of the workers having technical jobs have a low level of education. We see similar figures for the professions like power press, Hydraulic press operators. Accountants and executive officers have tertiary level education on average. For the managerial jobs, the average level of education is slightly higher than the higher secondary level. For the production floor workers, the current level of experience is significantly higher than that of their level of education years. Among these workers, EDM machine/ Laundry machine operators have the highest years of experience.

Table 7: Horizontal and vertical mismatch

Occupation	Total Employment	Vertical mismatch (Years of schooling) (%)			Horizontal mismatch (field of study)
		Total	Over Qualification	Under qualification	(%)
Manager	183	0.64	0.11	0.53	0.55

Occupation	Total Employment	Vertical mismatch (Years of schooling) (%)			Horizontal mismatch (field of study)
		Total	Over Qualification	Under qualification	(%)
Professional	32	0.47	0.16	0.32	0.37
Sales and clerk	90	0.54	0.04	0.5	0.26
Technician	240	0.89	0.1	0.79	0.46
Craft and others	2,614	0.88	0.13	0.75	0.2
Full sample	3,159	0.83	0.12	0.71	0.28

We observed during study a significant discrepancy between the desired fields of education and actual level of education from the Tables 5 and 6. The actual level of education is about 3 years lower than what is expected by the employers for all workers. This gap is higher for the technology related workers than the management related workers. There is also a higher demand for workers with science background than the enterprises actually have.

In order to shed more light on this mismatch, Table 7 identifies both the vertical and horizontal mismatches based on Table 5 and Table 6. First consider vertical mismatch. On average, we find staggering 80 percent vertical mismatch for the full sample. This implies that 80 percent of the firms reported that there was a discrepancy between the desired level and actual level. This mismatch is the highest for the technology related workers - 89 percent for the associate professionals and technicians and 88 percent for the craft and plant workers. The enterprises experienced 47 percent of vertical mismatch for professionals and 54 percent for the sales related workers.

As discussed above, we also divide the vertical mismatch into over and under qualification. For the full sample, under-qualification dominates over-qualification. That is, the employers demand more years of education than they actually have. The share of under qualification for the full sample is 71 percent and over-qualification is 12 percent. Again, the incidence of under-qualification is the highest for the technology related workers such as associate professionals and technicians (79 percent) and craft and plant workers (75 percent). This share is highest for the sales workers (91 percent) and lowest for the professionals (67 percent).

As expected, horizontal mismatch is lower than the vertical mismatch as most of the workers have education well below the level of chosen fields. We find that there is 28 percent of horizontal mismatch. This mismatch is the highest for the managers (55 percent) and the lowest for the craft and plant workers (20 percent).

Table A3 in appendix shows detailed occupation-wise horizontal and vertical skill mismatch of the workers of the light engineering sector. Due to having low years of education on average vertical mismatch is higher than 80 percent for almost all of the floor level workers.

However, when it comes to horizontal mismatch of skills, the percentage is quite low for this group. For the technical worker, both types of skill mismatch are ubiquitous in this sector. About 90 percent of the technicians are subject to vertical mismatch of skill and in the case of the horizontal mismatch, this figure is around 44 percent. For the managerial posts, both of these mismatches are quite high. Another notable thing is most of the vertical mismatches occur due to under qualification. The percentage of under qualification is higher among technical and managerial jobs.

4.4 Skill Shortage

We used the conceptual framework outlined in section 2 to capture skill shortage in the light engineering sector. Following this conceptual note, we create the following table.

Table 8: Difficulties in filling up vacancies

Total Employment	Number of unfilled vacancies per enterprise	Difficulties in filling up vacancies (1 to 10 scale)	If a vacancy is occurred/posted/advertised today, how long will it take to fill up the position?			
			Almost instantly	Less than a week	More than a week and less than a month	A month or more than a month
183	0.05	6.53	0.74	10.29	14.71	74.28
32	0.11	5.72		5.56	27.78	66.67
90	0.26	5.13	3.51	42.11	0	54.38
240	0.42	6.85	4.44	31.11	33.33	31.11
2,614	0.59	5.88	4.35	19.9	54.35	21.39
3,159	0.48	6.02	3.4	17.28	47	32.32

The Table 8 shows that at the time of interview, only 0.48 posts per enterprise were vacant. This vacancy is the highest for crafts and plant workers (0.59), followed by the associate professionals (0.42). We asked the respondents to pick a number between 1 and 10, with higher the number, higher the difficulties to fill up the vacancy. For the full sample, this is

6.02. This score is only 5.88 for the craft and plant workers. This figure ranges from 5.13 for sales related workers to 6.85 for associate professionals and technicians. We then explored it more by asking if a vacancy is occurred/posted/advertised today, how long it will take to fill up the position. On average, for all occupations, 47 percent of the firms reported that it would take more than a week but less than a month and 32 percent reported that it would take a month or more. In the case of craft and plant workers, about 80 percent of the firms opined that they could hire workers in less than a month. Managers, professionals and sales related workers are relatively hard to recruit as it takes more than a month in more than half of the cases.

Table A4 shows that when it comes to filling up the vacancies the managerial and technical

jobs are the hardest. On a scale of 1 to 10, filling up a position of managing director the level of difficulty on average is 7.88. For the electrical/molding engineers and technicians this is about 7. The level of difficulty is also a bit high for the positions like Boring man, welder, painter, which is around 6.2. This is because most of them are on-job trained and it is often hard to get better replacements for these positions. The level of difficulty in filling up vacancies is also reflected in the number of days filling up these positions. Most of the managerial and technical positions take around a month if vacant. In the case of the production floor workers, most of the positions get filled up within a month.

Table 9: Reasons for hard to fill-up vacancies (those who scored between 7 and 10 on a 1-10 scale)

Occupation	No. of firms reporting why it is hard to fill up blank posts	Poor payment and other facilities (%)	Low number of applicants with the required skills (%)	Low number of applicants with required attitude and motivation (%)	Low number of applicants in general (%)	Less work experience than the firm demands (%)	Too much competition from other employers
Manager	58	43.84	91.78	75.34	50.68	58.9	31.51
Professional	6	66.67	66.67	83.33	33.33	100	66.67
Technician	63	50	92.11	71.05			
Sales and	6	66.67	66.67	66.67	33.33	50	50
Crafts and other	112	43.78	83.13	76.31			
Total	120	45.61	85.85	75.12	65.37	57.07	50

Now we asked the respondent to consider the cases for which scores on the difficulty level of filling up vacancies is higher than 7 (7-10). These are the cases of hard to fill vacancies.

Based on pre-survey piloting, we gave them 6 major options. About 86 percent identified that lower supply of skill is a major reason for skill shortage. This percentage is about 92 percent for the managers and associate professionals. Poor payment has not been a major factor relative to others – only 46 percent thought that this is an issue. Lack of motivation of the applicants has been held responsible by about 75 percent. About 57 percent thought that job seekers come with less experiences than demanded and causing skill shortage.

Compared to other factors, competition from other firms is also not seen as a big threat for hiring workers, compared to other causes.

4.5 Impact of skill shortage on enterprises

We now try to find out the impact of skill shortage on the light engineering firms. In this case also, we gave the respondents with a number of scenarios and asked them if such scenarios have zero impact, some impact, moderate impact, high impact and very high

impact.

Table 10: Impact of skill shortage on enterprises

Occupation	Obs.	Faced loss in sales or order due to competition (Domestic/ International)					Delay in developing the quality of product				
		No Impact	Some impact	Moderate impact	High impact		No Impact	Some impact	Moderate impact	High impact	Very high impact
Manager	62	22.37	51.32	18.42	6.58	1.3	25	48.68	23.68	2.63	
Professional	28	15.63	34.38	21.88	21.88	6.3	15.63	28.13	21.88	31.25	3.13
Technician	71	5.1	28.57	46.94	15.31	4.1	12.24	25.51	44.9	16.33	1.02
Sales and clerk	11	16.67	58.33	25	0	0	8.33	25	66.67	0	0
Crafts and other	119	7.98	23.69	45.64	16.46	6.2	9.73	28.68	34.91	21.7	4.99
Total	120	9.85	29.08	40.87	15.02	5.2	12.28	30.53	35.06	18.58	3.55

Skill shortage is reported to have moderate impact on sales due to competition and this is largely due to shortage of crafts and plant workers as well as associate professions and technicians. Skill shortage in sales related workers are largely held responsible for the moderate impact of delay in developing quality products.

Table 11: Impact of skill shortage on enterprises (continued)

occupation	Have difficulties maintaining standard quality					Experienced an increase in operating cost				
	No Impact	Some impact	Moderate impact	High impact	Very high impact	No Impact	Some impact	Moderate impact	High impact	Very high impact
Manager	35.53	40.79	22.37		1.32	10.53	35.53	34.21	17.11	2.63
Professionals	28.13	21.88	37.5	12.5		34.38	12.5	28.13	18.75	6.25
Technician	24.49	23.47	36.73	13.27	2.04	12.24	21.43	42.86	15.31	8.16
Sales and clerk	33.33	16.67	41.67	8.33		33.33	16.67	33.33	16.67	
Others	21.7	19.45	34.41	19.7	4.74	14.46	16.71	38.15	22.44	8.23
Total	24.39	22.78	33.6	15.67	3.55	15.02	19.55	37.8	20.36	7.27

Skill shortage of the professionals, associate professionals and craft and plant workers are found to have moderate impact on maintaining the quality of the products and an increase in operating costs.

Table 12: Impact of skill shortage on enterprises (continued)

Occupation	Have difficulties introducing new work practice					Increased workload on other workers				
	No Impact	Some impact	Moderate impact	High impact	Very high impact	No Impact	Some impact	Moderate impact	High impact	Very high impact
Manager	9.21	38.16	43.42	7.89	1.32	22.37	40.79	31.58	5.26	
Professionals	6.25	21.88	40.63	25	6.25	21.88	15.63	46.88	12.5	3.13
Technician	5.1	29.59	45.92	12.24	7.14	15.31	17.35	36.73	28.57	2.04
Sales and clerk	8.33	58.33	8.33	25		58.33	16.67	8.33	8.33	8.33
Crafts and other	2.24	27.93	42.39	19.95	7.48	10.97	20.7	43.89	22.69	1.75

Total	3.88	29.73	42.33	17.61	6.46	14.54	22.29	40.71	20.68	1.78
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Again, the shortage of technical workers is reported to have moderate impact on introducing new work practice and an increase in workload.

Table 13: Impact of skill shortage on enterprises (continued)

Occupation	Have to outsource work					Withdraw from offering certain products or services altogether				
	No Impact	Some impact	Moderate impact	High impact	Very high impact	No Impact	Some impact	Moderate impact	High impact	Very high impact
Manager	81.58	7.89	7.89	2.63		34.21	46.05	17.11	1.32	1.32
Professionals	53.13	15.63	31.25	2.63		31.25	25	34.38	9.38	
Technician	58.16	24.49	13.27	3.06	1.02	28.57		28.57	6.12	1.02
Sales and clerk	91.67			8.33		66.67	16.67	8.33	8.33	
Crafts and other	43.64	21.95	23.94	7.73	2.74	21.2	26.68	39.15	9.48	3.49
Total	52.02	19.87	20.19	5.98	1.94	25.36	30.21	33.93	7.92	2.58

Skill shortage has not been found to push firms to outsource works much. However, some withdrawal of products due to skill shortage has been reported.

4.6 Coping with Skill Shortage

Table 14: Coping of the firms with skill shortage

Occupation	No. of Obs.	Will address skill shortage? (%)	Increasing salary (%)	Increasing number of training (%)	Redefining existing jobs (%)	Increasing expenditure on ad or recruitment (%)	Using new recruitment methods (%)
Manager	61	53.33	75	42.5	70	10	45
Professionals	27	71.88	78.26	34.78	52.17	43.48	73.91
Technician	70	83.51	77.78	64.2	79.01	11.11	40.74
Sales and clerk	11	50	100	33.33	50	33.33	66.67
Crafts and other	119	86.47	71.59	68.12	83.19	18.84	50.43
Total	120	80.49	73.54	63.43	79.6	18.18	49.7

About 80 percent of the enterprises noted that they would address the problem of skill shortage. About 74 percent of the firms will address this problem by increasing salary of the workers to attract more skilled labor. All reported firms think that they should increase the salary of the sales related workers to hire skilled workers. About 63 percent of the firms reported that they would increase the number of trainings for the workers, particularly the craft workers and machine operators and associate professionals and technicians.

Interestingly, redefining jobs has also been agreed by about 80 percent of the firms and

they think it is particularly necessary for technical workers. About half of the enterprises want to use new recruiting methods, particularly for the professionals and sales related workers.

4.7 Level of Skill and Skill Gap

Table 15: Level of skill (proficiency) and skill gap of the workers

Occupation	No. of people employed	Level of proficiency of the workers (1-10 scale)	Skill gap (10 minus level of proficiency)
Manager	183	7.84	2.16
Professionals	32	7.00	3
Technician	90	7.85	2.15
Sales and clerk	240	7.28	2.72
Crafts and other	2614	6.64	3.36
Total	3159	6.94	3.06

In order to understand the gap between the desired level and actual level of proficiency to perform a job, we asked the respondent to scale the level of proficiency of the workers on a 1-10 scale with higher number signifying higher proficiency. The average level of proficiency is 6.94 for all workers. Interestingly, craft workers and machine operators have the lowest score – 6.64, compared to other occupations. The level of proficiency is the highest for the associate professionals and technicians (7.85), followed by the managers (7.84). We then measure the skill gap by deducting the level of proficiency from the max value (10). Skill gap is the highest for the crafts and plant workers which is about 34 percent. On average, the extent of skill gap is about 31 percent for all workers.

4.8 Training of the Workers

In order to better conceptualize the types of training, we divide all training received by the workers into five categories as following.

Table 16: Types of training with examples

S.L	Types of training	Examples of training
1	Induction Training for the new employees	Basic training on Lathe machine operation, Welding machine operation, Mechanical parts, etc.
2	Health and safety related trainings	Health and Safety training
3	Task specific trainings	Modern molding practice, training on cooling tower setting, Lathe machine and welding machine operation, etc.
4	Management related trainings	Training on management
5	Training in new technology	Training on CNC Machine operation, Automobile parts, etc.

Table 17: Training received by the workers in the last 3 years

Types of training	Total persons received training	Duration of the training (%)				Got leave for training? (Whole training)	Who conducted training? (%)		Certified? (%)
		< 1 week	1-2 weeks	3-4 weeks	1-3 mon		External trainers in factory premise	External trainers outside factory premise	
Induction Training for the new employees	12	25	12.5	37.5	25	100	50	50	87.5
Health and safety related trainings	6	50	0	50	0	100	100	0	50
Task specific trainings	45	40	40	0	20	100	40	60	86.67
Management related trainings	2	50		50		100	100	0	50
Training in new technology	8	50	12.5	0	37.5	37.5	0	100	62.5
Total	73 (2.3%)	12.5	37.5	25	25	85.71	34.29	65.61	77.14

Only 73 workers out of 3159 workers received training in the last three years, which is only

2.3 percent. Three-fourth of the training's duration was less than a month, with 1-2 week training dominates constituting about 38 percent of all training received by the workers. Except for the training in new technology, the workers got leave for the whole training. About two-third of the training are conducted outside of the factory premise and the rest in the factory premise. Average expenditure in training by the firms in the last 3 years is only Taka 9200. And about 77 percent of the training offered certificates.

4.9 Industry-TVET Linkage

As shown in the Table 18, the link between the enterprise and TVET is very weak. In the last 2 years only 20 firms reported to have their workers sent to TVET for training.

Interestingly, this number is higher for the smaller firms than the medium and large firms. 23 workers from small firms, 4 from medium firms and 23 from large firms were sent to TVET. The share of workers with TVET linkage is only 1.58 percent.

Table 18: Industry-TVET linkage

Size	No. of Obs.	Number of employees sent to TVET for training
Small	13	23
Medium	3	4
Large	4	23
All	20	50

4.10 Automation and Jobs

We also discuss the extent of automation and its potential threat in displacing jobs (Table 19). We asked to scale the extent of automation a particular occupation may experience in the next 5 to 10 years on a 1-10 scale. On an average the score is 5.58. According to the respondents, the sales related works are under more threat than technology related works. As a result, the score on the job displacement scale for the sales related workers is also higher than others. About 47 percent of the firms think that workers need training to embrace the automation.

Table 19: Extent of automation and job displacement

	Obs.	To what extent this occupation is subject to automation in next 5 to 10 years (1-10 scale)	Due to automation, what will be the extent of job displacement? (1-10 scale)	Extent of routine work (1-10 scale)	Do you have any plan to train your workers to embrace automated technology? (%)
Manager	2	5.00	4.00	5	50
Professionals					
Technician	14	5.79	5.50	4.86	42.86
Sales and clerk	2	7.00	8.00	2.00	100
Crafts and other	117	5.57	5.37	4.74	47.04
Total	118	5.58	5.38	4.73	47.17

4.11 Occupation-wise Demand Projection

We also collect information on the occupation wise projection of the workers in the next 5 to 10 years, both qualitatively and quantitatively. According to Table 20, about 12 percent of the firms think that there will not be any growth of jobs in the coming years. About two-thirds believe that there will be moderate growth, driven by the growth of the professionals and associate professionals (89 percent). Then we wanted to know the number of the workers the firm is expected to have in 2023, 2025 and 2030. Compared to 2019, the respondents believe that the number of workers will increase by 34 percent, about 8.2 annual growth rate. However, the growth of the jobs of the managers and professionals are bleak in the next 4 years – about 10-13 percent. In 2019-2025 period, expected growth of the firms in terms of the workers is about 78 percent, which is more

than 12 percent. By 2030, the expected growth of the total workers is 145 percent, with more than 13 percent annual growth. It appears that the longer term outlook is better, as projected by the firms.

Table 20: Growth projection of the workers by occupations

Occupations	Total employed in 2019	Growth of the number of works in next 5 to 10years					Percentage increase in 2023 relative to2019	Percentage increase in 2025 relative to2019	Percentage increase in 2030 relative to2019
		Negative growth	No growth	Moderate growth	High growth	Very high growth			
Manager	183		41.61	56.93	1.46		13	48	96
Professionals	32		11.11	88.89			10	84	147
Technician	90	0.88	3.51	88.6	6.14	0.88	34	82	147
Sales and clerk	240		13.04	73.91	13.04		35	93	180
Crafts and other	2614	0.88	7.52	61.4	28.95	1.16	35	79	145
Total	3159	0.72	11.59	64.6	22.01	1.08	34	78	145

Table A5 shows the detailed occupation wise growth projections. From the table, it is apparent that jobs related to technology will witness the highest level of growth. It is expected that the production floor workers will witness around 150 per cent increase at the end of this upcoming decade. Some occupations like salesman, storekeeper, electrical/molding engineer, hydraulic press machine operators etc. are expected to grow double or more than double at the end of the year 2030. This perhaps indicates the optimism of the expansion of the firms in the future. However, little growth is expected from the managing director position. However, this is not the case for the production managers and the supervisors.

CHAPTER 5: FINDINGS FROM WORKER SURVEYS

Table 21: Categorization of the workers

Name of occupations	BSCO Code	Definition	Number of workers	Examples
Managers	1	Managers plan, direct, coordinate and evaluate the overall activities of enterprises, governments and other organizations, or of organizational units within them, and formulate and review their policies, law, rules and regulations.	53	General Manager, Production Manager, Factory Manager etc.
Professionals	2	Professionals increase the existing stock of knowledge, apply scientific or artistic concepts and theories, teach about the foregoing in a systematic manner, or engage in any combination of these activities.	8	Mechanical Engineer, Chemist, Computer programmer, marketing specialist, etc.
Technicians and associate professionals	3	Technicians and associate professionals perform mostly technicians and related tasks connected with research and the application of scientific or artistic concepts and operational methods, and government or business regulations.	166	Technicians, Foreman, Delivery in charge, Computer operator etc.
Service and sales workers	5	Service and sales workers provide personal and protective services related to travel, housekeeping, catering, personal care, or protection against fire and unlawful acts, or demonstrate and sell goods in wholesale or retail shops and similar establishments, as well as at the stalls and on markets.	8	Salesman, Store keeper, marketing representative etc.
Craft workers & plant operators	7+8	<p>Craft and related trades workers apply specific knowledge and skills in the fields to construct and maintain buildings, form metal, erect metal structures, set machine tool, or make, fit, maintain and repair machinery, equipment or tools, carry out printing work to produce or process foodstuffs, textiles, or wooden, metal and other articles, including handicraft goods.</p> <p>Plant and machine operators, and assemblers operate and monitor industrial and agricultural machinery and equipment on the spot or by remote control, drive and operate trains, motor vehicles and mobile machinery and equipment, or assemble products from component parts according to strict specifications and procedures.</p>	1,287	Setting mechanic, Mold fitter, Gas cutting operator, Welder, Denting machine operator, Shaper machine operator, CNC machine operator, Painter, Casting machine operator, Power press operator, Laminating machine operator etc.
			1522	

5.1 Socioeconomic background of the workers

Average age of the managers is about 40 years and all of them are male. About 94 percent of the managers are Muslim. Their average monthly salary including all benefits is Taka 18961. However, their household income, which include other earning members, is Taka 31,777. The professionals are slightly younger than the managers – their average age is 36years. All the professionals are male and about 88 percent are Muslim. Their monthly salary is very similar to the managers - Taka 18403. And the monthly household income is Taka 22234. Average age of technicians and associate professionals is about 38. Their average monthly salary is Taka 17403 and average household income is Taka 26086.

Service and sales workers are relatively younger - average age is about 34 years and all of them are male. Their monthly salary is Taka 18688 and household income is Taka 32219. Craft workers and plant operators, who constitute the major share of the workers, are theyoungest among all occupation groups – average age is about 32 years and they draw the lowest monthly salary. However, their household income is as large as the managers or theprofessionals.

In short,

- I. Light engineering is a male dominant industry.
- II. Floor level workers’ salary is close to the minimum wage of the RMG sector.
- III. Occupations involving management, sales and higher level of specialization drawsimilar level of salaries.

Table 22: Socio-economic and demographic background of the workers

Occupations	Obs.	Age (years)	Male (%)	Religion (%)		Monthly Personal Income (BDT)	Monthly Household Income (BDT)
				Muslim	Hindu		
Managers	53	40.32	100	94.34	5.66	18961	31777
Professionals	8	36	100	87.5	12.5	18403	33234
Technician	166	38.09	99.40	92.77	5.42	17403	26086
Sales and clerk	8	34.38	100	100		18688	32219
Crafts and other	1,287	32.45	98.21	93.71	6.06	12321	19556
Full sample	1522	33.37	98.42	93.63	5.98	13152	20832

5.2 Educational Background of the Workers

Table 23: Educational background of the workers by occupations

Occupation Category	Average years of Schooling	Share of PSC/class5 passed (%)	Share of JSC / class8 passed (%)	Share of SSC passed (%)	Share of HSC passed (%)	Share of Diploma passed (%)	Share of Honors passed (%)	Share of Masters passed (%)
Managers	12.77	96.23	92.45	88.68	66.04	9.43	39.62	11.32
Professionals	13.00	100	87.5	75	75	12.5	50	12.5

Technician	7.43	78.31	49.40	27.71	16.87	6.02	4.22	1.81
Sales andclerk	13.00	100	87.5	75	75	0	50	12.5
Crafts andother	5.73	62.08	29.22	10.18	4.35	0.70	0.93	0.23
Full sample	6.23	65.44	34.23	15.51	8.61	1.64	3.15	0.92

For all workers, average level of education is only 6.23 years. About two-thirds of the workers have passed the PSC exams or studied beyond grade 5. About one-third of the workers have passed the JSC exams or have 8 years or more years of education. About 15.5 percent of the workers have passed SSC or equivalent examinations and 8.6 percent have the higher secondary degree. Out of 1522 workers, only 3.15 percent have bachelor degrees and about 1 percent have master's degree.

Average level of education of the managers is only 13. Among them about two-thirds have HSC degree and higher. There are 3 managers (40%) with honors degree and one with Master's degree. So, the managers of the light engineering sector are not the same as other formal industries. Half of the professionals have bachelor degree, 13 percent have masters and the same percentage have diploma degree. That is, three-fourths of the professionals have degrees beyond HSC. In the case of technicians and associate professionals, average years of schooling is just above 7 years. Only 17 percent of them have passed HSC with 6 percent diploma. Service and sales workers are as educated as the professionals - their average years of education is 13 years. Among them, 50 percent are honors graduates and

12.5 percent have master's degree. Craft workers and plant operators are the least educated – average years of schooling is only about 6 years. Only 10 percent of them have passed the SSC examination. About one third of them did go past grade 5.

In short,

- I. Overall level of education of the workers of the light engineering is very low, including the managers and professionals.
- II. As the craft and plant operators largely have primary level education, they may not be the right target group for any sophisticated trainings which demand higher level of basic education.

Table 24: Educational background of the workers: PSC examination/ class 5 passed

Occupation category	Obs.	Type of Exam (%)			Rural (%)	Type of the Institute			Result GPA
		Bengali Medium	TVET	Madrassa		Govt.	Private	NGO & Others	
Managers	51	98.04	0	1.96	33.33	76.47	21.57	1.96	3.43
Professionals	8	100	0		50	75	25	0	N/A
Technician	130	96.18	0	3.82	50.77	86.92	8.46	4.62	3.43
Sales andclerk	8	100	0	0	62.5	62.5	37.5	0	3.44
Crafts	799	94.24	0.13	5.63	60.45	82.1	15.27	2.63	3.29

andother									
Full sample	996	94.78	0.1	5.12	57.73	82.23	14.96	2.81	3.43

About 95 percent of the workers with grade 5 are from Bengali stream and the rest from the madrasa stream. About 58 percent of workers passed PSC/ grade 5 from the schools located in the rural areas. Public primary schools dominate largely - about 82.23 percent are from public schools.

Most of the workers were in Bengali medium schools at the primary level with some madrasa stream. About 6 percent of the craft and plant workers passed PSC equivalent under madrasa board. More than half of the workers went to rural public schools at the primary level. Average GPA of the PSC examination is 3.43, with little differences between all groups except craft and plant workers. The average GPA of the PSC exam was 3.29 for the craft workers and plant operators.

In short,

- I. The workers are largely from Bengali medium public schools.
- II. The craft workers and plant operators not only have lower-level education, their results (GPA) are also worse than other occupation groups.

Table 25: Educational background of the workers: JSC examination/class 8 passed

Occupation Category	Obs.	Type of Exam (%)			Rural (%)	Type of the Institution (%)			Result GPA
		Bengali Medium	TVET	Madrasa		Govt.	Private	NGO & Others	
Managers	49	89.8	0	10.2	30.61	14.29	85.71	0	4.00
Professionals	7	100	0		42.86	14.29	85.71	0	5.00
Technician	82	96.39	0	3.61	45.12	14.63	84.15	1.22	3.29
Sales and clerk	7	100	0	0	28.57	14.29	85.71	0	2.00
Crafts and other	376	90.26	0.26	9.47	56.5	17.24	81.43	1.33	3.64
Full sample	521	91.44	0.19	8.37	51.72	16.48	82.38	1.15	3.61

Among the workers who took JSC exam/ passed 8th grade, 91 percent of them were from Bengali medium and 8 percent from madrasa. The share of madrasa students at the JSC level is noteworthy. Only 51.72 percent workers took JSC or equivalent exams from rural high schools as opposed to 57.73 for PSC or equivalent exams. Since most of the secondary schools are private, about 82.38 percent passed JSC from private schools. In the case of results, we observe significant variations across occupation groups. Average GPAs for the managers and professionals are 4 and 5 respectively. Interestingly, the service and sales workers had the lowest average GPA – which is 2. Average GPA of the craft workers and plant operators is 3.64, which is slightly higher than that of PSC.

In short,

- I. A noteworthy share of workers switched to madrasa stream after the primary level.

II. The average GPA is higher for the workers who completed JSC than that of PSC.

Table 26: Educational background of the workers: SSC examination

Occupation Category	Obs.	Type of Exam (%)			Rural (%)	Type of the Institution (%)		Result			
		Bengali Medium	TVET	Madrasa		Govt.	Private	1st Dev.	2nd Dev.	3rd Dev.	GPA
Managers	47	87.23	2.13	10.64	27.66	12.77	87.23	27.27	69.7	3.03	4.08
Professionals	6	100			33.33	16.67	83.33	33.33	66.67	0	3.67
Technician	46	95.65	2.17	2.17	52.17	17.39	82.61	25.00	70	5	3.67
Sales and clerk	6	100	0	0	33.33	0	100	0	50	50	3.25
Crafts and other	131	78.91	7.03	14.06	53.54	21.88	78.13	8.33	80.56	11.11	3.68
Full sample	236	84.98	4.72	10.3	46.98	18.45	81.55	19.15	73.4	7.45	3.71

15.5 percent of the workers passed the SSC examinations. Among them 85 percent are from Bengali medium, 10 percent from madrasa and 5 percent from TVET. Those who took SSC examination before the GPA system was introduced, more than two-thirds secured 2nd division. In the case of craft workers and plant operators this figure is about 81 percent. Apart from the managers (4.08), GPA is the highest for the craft and plant workers (3.68). However, only about half the craft and plant workers who passed JSC went on to pass SSC examination.

Table 27: Educational background of the workers: HSC examination

Occupation Category	Obs.	Type of Exam (%)			Rural (%)	Type of the Institution (%)		Result			
		Bengali Medium	TVET	Madrasa		Govt.	Private	1st Dev.	2nd Dev.	3rd Dev.	GPA
Managers	35	87.88		12.12	9.09	42.42	57.58	10.53	89.47	00	3.57
Professionals	6	100			100	40	60	00	100	00	4.33
Technician	28	100			29.41	17.65	82.35	00	50	50	3.54
Sales and clerk	6	100			33.33	33.33	66.67	00	50	50	3.25
Crafts and other	56	91.67		8.33	42.42	34.04	65.96	00	88.89	11.11	3.32
Full sample	131	92.59		7.41	21.3	34.26	65.74	5.56	83.33	11.11	3.33

8.6 percent of the workers have the HSC degree. Most of the workers are from Bengali medium (93 percent), with about 7 from madrasa. As far as result is concerned before the GPA system, they obtained second division mostly, with 11.11 percent third division. 50 percent of the technicians and associate professionals as well as service workers obtained 3rd division. Average GPA is 3.3. Except for professionals (4.33), the average GPA varies between 3.25 and 3.57 for other occupations.

Table 28: Educational background of the workers: Diploma Degree

Occupation Category	Obs .	Subject (%)			Duration of the course (%)			Type of the Institution (%)			Result			
		Sci.	Arts	Com.	Two years	Three years	Four years	Govt .	Pvt.	NGO & Others	1st Dev .	2nd Dev .	3rd Dev .	GPA
Managers	14	42.86	14.29	42.86	35.71	35.71	28.57	64.29	35.71		22.22	55.56	22.22	2.60
Professionals	00													
Technician	13	76.92	15.38	7.69	7.69	15.38	76.92	69.23	30.77	00	00	100	00	3.00
Sales and clerk	2	00	00	100	00	00	100	50	50	00	00	00	00	3.00
Crafts and other	13	76.92	7.69	15.38	15.38	00	84.62	53.85	38.46	7.69	50.00	50	00	3.18
Full sample	42	61.9	11.9	26.19	19.05	16.67	64.29	61.9	35.71	2.38	23.08	61.54	15.38	3

Only 42 workers out of 1522 (2.76%) have diploma degree. The distribution of science, arts and commerce among the diploma degree holders is 62, 12 and 26 percent respectively.

Among the occupational groups, about 77 percent of the technicians and associate professionals, and craft workers and plant operators are from science stream. The managers came mostly from science (43 percent) and commerce (43 percent) background. Among the workers with diploma degree, 64 percent have four year diploma, 17 percent have three year diploma and 19 percent two year diploma degree. The share of four year diploma degree is the highest for the craft and plant workers (85 percent). On average, 62 received the degree from public institutions and 36 from private institutions. In the older system of division, 23 percent received 1st division and 62 percent received 2nd division.

Average GPA is 3 for all workers. The average GPA is the highest for the craft and plant workers.

Table 29: Educational background of the workers: Bachelor Degree

Occupation Category	Obs .	Subject (%)			Duration of the course (%)			Type of the Institution (%)			Result			
		Sci.	Arts	Com .	Two years	Three years	Four years	Govt .	Pvt.	1st Dev .	2nd Dev .	3rd Dev .	GP A	
Managers	13	15.38	53.85	30.77	38.46	46.15	15.38	61.54	38.46	0	100	0	3.33	

Occupation Category	Obs .	Subject (%)			Duration of the course (%)			Type of the Institution (%)		Result			
		Sci.	Arts	Com	Two year s	Thre e years	Four year s	Govt .	Pvt.	1st Dev .	2nd Dev .	3rd Dev .	GP A
Professional s	4	0	25	75	25	50	25	75	25	0	50	50	3
Technician	8	12.5	50	37.5	25	37.5	37.5	37.5	62.5	0	100	0	2.71
Sales and clerk	3	33.33	33.33	33.33	33.33	33.33	33.33	33.33	66.67	0	100	0	2.5
Crafts and other	10	60	20	20	10	40	50	70	30	0	100	0	2.88
Full sample	38	26.32	39.47	34.21	26.31	42.11	31.58	57.89	42.11	0	84.62	15.38	2.92

Only 38 workers out of 1522 (2.5 percent) have bachelor degree. Out of these 38 workers, 26percent graduated from science, 39 from arts and 34 from commerce. Interestingly, 60 percent of the craft and plant workers with bachelor degree are from science stream. Arts (54 percent) and commerce (31 percent) were the majors in bachelor degree for the managers. Among the workers with bachelor degree, 85 percent obtained second division and 15 percent third division. Average GPA for all workers is 2.92, which varies from 2.71 to 3.33 across occupations.

Table 30: Educational background of the workers: Master's Degree

Occupation Category	Obs .	Subject (%)			Duration of the course (%)		Type of the Institution (%)		Result
		Sci.	Arts	Com	One year	Two years	Govt.	Private	GPA
Managers	2	0	50	50	100		50	50	3.00
Professionals	1	0		100		100	100	0	2.00
Technician	2	0	100		100		100	0	3.00
Sales and clerk	0								
Crafts and other	2	50		50	50	50	100	0	3.00
Full sample	7	14.29	14.29	71.43	71.43	28.57	85.71	14.29	2.86

Only 7 workers in our sample of 1522 workers have master's degree. They are mostly from arts and commerce. The average GPA is 2.86.

5.3 Technical and Vocational Training of the Workers

Table 31: Technical and vocational training of the workers

Occupation Category	Obs.	Ever attended vocational Training? (%)		Ever attended a vocational Training not arranged by the employers? (%)		Ever attended a vocational Training arranged by the employers? (%)	
		Yes	No	Yes	No	Yes	No
Managers	53	16.98	83.02	15.09	84.91	5.66	94.34
Professionals	8	25	75	25	75	0	100
Technician	166	14.46	85.54	12.05	87.95	4.22	95.78
Sales and clerk	8	12.5	87.5	12.5	87.5	0	100
Crafts and other	1,287	6.99	93.01	5.59	94.41	1.86	98.14
Full sample	1522	8.28	91.72	6.77	93.23	2.23	97.77

Only 126 workers out of 1522 workers (8.3) have ever attended any vocational training. Among the workers, only 6.77 percent workers attended training not arranged by the employers and 2.23 percent workers attended training arranged by the employers. Only 7 percent of the craft and plant workers, and 14 percent of the technicians and associate professionals received training. These trainings are mostly arranged by themselves or NGOs or the government.

Table 32: Technical and vocational of the workers not arranged by employers: Managers

Category of Training	Obs.	Duration of the course (%)						Certified (%)	BTEB Certified (%)	Expenditure borne by (%)			Satisfaction Scale of 1 to 10
		< 1 week	1-2 weeks	3-4 weeks	1-3 months	4-6 months	>6 months			Self	Govt	NGO	
Engineering & Technical	3			33.33	33.33	33.3		100	100	66.7		33.3	8
Agriculture related	2						100	100	100			100	8
Manufacture & Crafts	1		50	50				100	100		50	50	7
Service and creative courses	1	100						0	0			100	7
Full sample	8	14.3	14.29	14.29	28.6	14.3	14.3	100	87.5	25	25	50	7.63

Now we explore the type of training received by the managers which were not arranged by the employers. We categorize all trainings into four groups – engineering and technical, agriculture related, manufacturing and crafts, service and creative courses. Agriculture related courses are more than six months long whereas manufacturing and crafts related courses span from 1-2 weeks to 3-4 weeks. Trainings on engineering and technical issues are mostly month-long courses. All the trainings, except service and creating courses, are certified and they are certified by BTEB. The cost is borne mostly by NGOs (50 percent).

The satisfaction level of all the course are equal and above 7 on a scale of 1 to 10.

Table 33: Technical and vocational of the workers not arranged by employers: Professionals

Category of Training	Obs.	Duration of the course (%)		Certified (%)	BTEB Certified (%)	Expenditure borne by (%)			Satisfaction Scale of 1 to 10
		3-4 weeks	1-3 months			Self	Govt.	NGO & Others	
Engineering & Technical	1		100	100	00	100			7
Agriculture related	1	100		100	100			100	6
Full sample	2	50	50	100	50	50		50	6.5

Only 3 professional received trainings not arranged by the employers. Engineering and technical trainings were not BTEB certified. The cost of training was borne either by the worker themselves or the NGOs. The satisfaction level is 6 and above.

Table 34: Technical and vocational of the workers not arranged by employers: Technicians and associate professionals

Category of Training	Obs.	Duration of the course (%)					Certified (%)	BTEB Certified (%)	Expenditure borne by (%)			Satisfaction Scale of 1 to 10
		< 1 week	1-2 weeks	3-4 weeks	1-3 mon	4-6 mon.			Self	Govt.	NGO	
Engineering & Technical	13	7.69	7.69	46.15	15.38	23.08	84.62	61.54	38.5	23.1	38.46	7.77
Manufacture & Crafts	5	20	20	20	20	20	100	40	20	40	40	6.6
Service and creative courses	1	100					0			100		4
Full sample	19	15	10	10	35	30	78.95	50	30	30	40	7.3

19 technicians and associate professionals received trainings not arranged by the employers. 65 percent courses were more than one month long. About 79 percent of the courses are certified and half of the courses are self-financed. Most of the engineering and technical courses were 3-4 weeks long (46 percent). These courses were largely certified (85) and certified by BTEB (62 percent). The cost of these expenditure were borne by themselves (38 percent), NGOs (38 percent) and the government (23 percent). The trainings on manufacturing and crafts are of different length, from less than a week to 4-6 months. All of them are certified but only 40 percent of them are certified by BTEB. These courses were largely sponsored by the government and NGOs. Technicians and the associate professionals received services and creative courses also which are shorter in duration and sponsored only by the government. The workers of this occupational group are not very satisfied with such courses as they scaled technical courses (7.77, 6.6) much higher than the service related ones (4) on a 1-10 scale.

Table 35: Technical and vocational of the workers not arranged by employers: Service and sales workers

Category of Training	Obs.	Duration of the course (%)		Certified (%)	BTEB Certified (%)		Expenditure borne by (%)		Satisfaction scale of 1 to 10
		4-6 months	>6 months		Self	Govt.	NGO & Others		
Engineering & Technical	1	100		100	100	100			7
Full sample		100		100	100	100			7

Service and sales related workers received only one engineering and technical trainings which were 4-6 month long and BTEB certified. These trainings were financed by the workers themselves.

Table 36: Technical and vocational of the workers not arranged by employers: Craft workers and plant operators

Category of Training	Obs.	Duration of the course (%)	Duration of the course (%)					Certified (%)	BTEB Certified (%)	Expenditure borne by (%)	Expenditure borne by (%)			Satisfaction
			< 1 week	1-2 weeks	3-4 weeks	1-3 months	4-6 months				>6 months	Self	Govt.	
Engineering & Technical	2	12.5	22.5	5	30	13	17.5	72.5	47.5	25.64	20.5	53.85	7.4	
Agriculture related	26			50		50		50	50		50	50	7.5	
Manufacture & Crafts	40	19.23	19.23	30.77	19.2		11.5	80	46.15	26.92	42.3	30.77		
Others	4	50	25	25				75	50	25		75	7.4	
Full sample	72	13.89	22.22	16.67	25	8.3	13.9	74.65	47.22	25.35	28.2	46.48	7.42	

72 craft workers and plant operators received four types of trainings not arranged by the employers. Only 2 workers received engineering and technical trainings which were of different duration, from less than a week to more than 6 months. Majority of such courses were 1-3 month long. About 73 percent of such courses were certified and 48 percent were certified by BTEB. These courses were largely financed by NGOs (54 percent), followed by self (26 percent) and government (21 percent). 40 craft and plant workers took courses on manufacturing and crafts which are also of varied length. About one-third of them are of 3-4 weeks. For all courses, about half of them are BTEB certified and NGOs are the largest financier. The workers seem to be satisfied with such courses and their satisfaction level varies little across the types of trainings.

5.4 Training Need Assessment

There is no denying the fact that to keep up with the technological innovations and changing nature of work, the workers of the Light Engineering sector would need more training. In this section, we tried to assess the need for training, especially for the occupations which need them the most. We started with investigating the workers' current need for

training, following the need for training for their career progression and in the context of the technological advancement and fourth industrial revolution. After that, for each of the firms, five occupations that need training the most were chosen.

Table 37: Need for training and threat of automation

Occupation Category	Training needed to increase your skill? (%)		Training needed for carrier progression? (%)		Training needed to adapt with the technological change? (%)		Opinion on extent of automation replacing your job (scale of 1 to 10) Mean
	Yes	No	Yes	No	Yes	No	
Managers	100		75.47	24.53	45.28	54.72	4.13
Professionals	100		87.5	12.5	50	50	4.25
Technician	99.37	0.63	86.75	13.25	54.22	45.78	3.94
Sales and clerk	100		62.5	37.5	75	25	4.75
Crafts and other	99.59	0.41	86.87	13.13	62.39	37.61	4.47
Full sample	99.58	0.42	86.33	13.67	60.91	39.09	4.4

Almost all workers of all occupation categories opined that they needed trainings for skill up-gradation. However, not all of them agreed that they needed training for career.

progression. This may indicate that there may not be one-to-one correlation between career progression and skill level. Interestingly, about 46 percent of the technicians and associate professionals and 38 percent of craft and plant workers noted that they did not need trainings to adapt with the technological changes. This may indicate the stagnation of the technological changes in light engineering sector. The workers in this sector don't think that automation will take their jobs away. We asked them to scale the threat of automation in replacing their jobs; the mean value is only 4.4 and this does not vary across occupations.

Table 37(b) depicts the occupation-based need for training. From the table, it is apparent that managers need not only modern management related training but also they require ICT training. When it comes to the supervisors and foremen we can see that they require machine maintenance and Health and safety training. Molding engineers pointed out the need for advanced training such as training on auto-molding methods. Measurement related training was demanded by almost all of the workers who deal with cutting, setting and fitting. Besides, it can be seen that even CNC machine operators are working in some of these firms, there is a need for the training of CNC machine operation. Another notable thing is most of the production floor workers shared their need for Health and safety-related training.

Table 38: 37(b) Occupation-wise Need for training

Sl. No.	Occupations	Training needed
1	Managing Director/Manager/President/Production manager	Modern management related training, computer and ICT related training

Sl. No.	Occupations	Training needed
2	Electrical Engineer/Molding Engineer	Training on auto-molding methods, basic/induction training, Training on electrical works
3	Foreman/Supervisor/Technician	Machine maintenance related training, Health and Safety training
4	Painter mechanic/Varnish mechanic	Polish and Varnish related training, Cutting and fitting related training, measurement related training, CNC operation related training, health and safety
5	Boring-man/Welder/Welder/Fitter/ Drilling-man/CNC Operator	training
6	Electrician	Training on modern electrical technology, health and safety training
7	Quality In-charge/Packaging man	Assessing the quality of the raw materials related training, advanced methods of packaging
8	Painting Machine operator/Cold heading machine operator	Design related training, color combination related training
9	Driver/Power pressman/Hydraulic pressman	Pipe fitting training, Machine maintenance operation training
10	Helper	Health and safety training

5.5 Self-assessment of Skill

Table 39: Self assessed skill and demand for skills

Occupation category	Level of self-assessed proficiency (scale of 1 to 10)	Formal education helps in performance (scale of 1 to 10)	Experience helps in performance (scale of 1 to 10)	Assessment of skill demand (in job) (scale of 1 to 10)	Assessment of skill demand (outside job) (scale of 1 to 10)	How hard it would be get a better job in case of termination? (Scale of 1 to 10)
Managers	7.42	7.06	7.38	7.3	7.02	5.36
Professionals	7.25	6.38	6.75	6.88	6.25	5.5
Technician	7.94	5.89	7.67	7.56	7.24	4.72
Sales and clerk	7	7.63	7.25	6.63	6.88	5.13
Crafts and other	7.35	4.91	7.33	7.05	6.9	4.76
Total	7.41	5.11	7.36	7.11	6.93	4.78

We asked the workers to assess a number of issues related to their skill and skill demand on a 1-10 scale. In the case of self-assessed proficiency, all of them scaled themselves above

7. The next question was if formal education helps for better performance. Interestingly,

managers and service and sales workers think formal education is important as their average score were above 7. The floor workers such as craft workers and plant operators' average points were only 4.91 – they seem to disagree that formal education helps in performance in their jobs. The points given by the technicians and the associate professionals are also lower (5.86) relative to non-technical occupations. Next two questions deal with the skill demand in job and outside job. Their scaling seem to indicate that technicians and associate professionals are in higher demand both in job and outside job. Technical persons seem to have better market demand and this is also manifested in the last question where we asked to scale the extent of difficulties they would face if they lose their jobs. Technicians and craft workers reported lower score in the scale than other occupations.

5.6 Extent of Formality

Table 40: Extent of formality

Occupation category	Type of contract (%)		Weekly paid leave (%)			Paid leave: Weekends (%)	Paid sick leaves (%)	Paid casual leaves (%)
	Written	Oral	One day	Two days	More than 2 days			
Managers	28.3	71.7	100			100	84.91	73.58
Professionals	50	50	100			100	62.5	50
Technician	10.24	89.8	99.4		0.6	100	86.75	56.02
Sales and clerk	37.5	62.5	100			100	100	62.5
Crafts and other	6.14	93.9	99.61	0.39		100	83.14	60.53
Full sample	7.75	92.3	99.61	0.33	0.07	100	83.57	60.45

We examine several aspects of the formality of the employment in the light engineering sector. Half of the professionals have written contracts - the highest among the occupation categories. Sales and service workers come next – about 38 percent of them reported to have written contracts. Among the managers, only 28 percent have written contracts. As expected, the floor workers – both technicians and associate professionals, and craft workers and plant operators are the least formal occupations as far as type contract is concerned. Only 10 percent of technicians and associate professionals and 6 percent of craft and plant workers are formally employed with written contracts. Almost all of the workers reported that they enjoy one day weekly paid leave. The majority of them also mentioned that they have the privilege to have paid sick leaves. It varies from 63 percent of technicians and associate professionals to 100 percent of the sales workers. Share of paid casual leaves are also not low given the fact that the incidence of written contract is low. This varies half of the workers to three-fourths.

Table 41: Extent of formality (continued)

Occupation category	Paid Maternity/ Paternity leave	Receive pension?	Have life insurance?	Have health insurance?	Have loan facility?
	(%)	(%)	(%)	(%)	(%)
Managers	24.53	1.89	3.77	5.66	77.36
Professionals	100				50
Technicians	26.51	0.6	3.01	2.41	76.51
Crafts and other	15.93	0.16	0.62	0.47	81.82
Full sample	17.21	0.26	0.99	0.85	80.95

In the case of female workers, there are paid maternity leaves. There is hardly any pension, life insurance or health insurance provided by the employers. However, there are some informal loan facilities for the workers – the owners often extend loans to the workers in time of their needs. About 82 percent of the craft workers and plant operators reported that they can borrow informally from the owners. This figure is 77 percent for both managers and technicians and associate professionals.

5.7 Satisfaction Level of the Workers

Overall satisfaction level with the jobs is higher for the professionals and technicians and associate professionals than other occupations. This is lowest for the service and sales workers and this comes largely from the inadequate salary. Three-fourths of the sales workers disagree, though slightly, that they are paid adequately. However, about half of the managers, professionals and craft and plant workers think that they are adequately paid.

Sales workers again are not satisfied with the job prospects - about 63 percent of them opined that they are not satisfied. About half of the professionals are have the same opinion. A large share of the workers across occupations mentioned that their supervisor are knowledgeable about their jobs

Table 42: Satisfaction of the workers I

Occupation category	Overall Satisfaction	I am paid adequately (%)					I am satisfied with my job prospect (%)					My supervisor is knowledgeable of my job				
		Mean (scale of 1 to 10)	Strongly disagree	Slightly disagree	Neutral	Slightly agree	Strongly agree	Strongly disagree	Slightly disagree	Neutral	Slightly agree	Strongly agree	Strongly disagree	Slightly disagree	Neutral	Slightly agree
Managers	6.79	3.77	30.19	1.89	52.83	11.32	3.77	28.3	1.89	49.06	16.98	1.89			16.98	81.13
Professionals	7.38		37.5		50	12.5	12.5	50		25	12.5				25	75
Technician	7.3	1.81	24.1	4.82	58.43	10.84		17.47	6.63	60.84	15.06	0.6		3.01	23.49	72.89
Sales and clerk	6.5		75		25			62.5		37.5					37.5	62.5
Crafts and other	6.73	2.8	35.51	8.55	48.48	4.66	2.87	33.33	15.31	42.11	6.37	0.23	0.54	2.33	38.23	58.66
Full sample	6.8	2.69	34.3	7.82	49.61	5.58	2.63	31.67	13.73	44.28	7.69	0.33	0.46	2.3	35.81	61.1

Table 43: Satisfaction of the workers II

Occupation category	I am satisfied with my workplace safety (%)					My employers offer me training opportunities				
	Strongly disagree	Slightly disagree	Neutral	Slightly agree	Strongly agree	Strongly disagree	Slightly disagree	Neutral	Slightly agree	Strongly agree
Managers	3.77	5.66	5.66	43.4	41.51	7.55	30.19	7.55	45.28	9.43
Professionals			12.5	25	62.5		37.5		50	12.5
Technician	0.6	10.24	7.83	50.6	30.72	9.04	30.72	13.86	39.16	7.23
Sales and clerk				50	50	12.5	12.5	37.5	37.5	
Crafts and other	0.23	10.1	6.14	60.76	22.77	10.72	38.85	18.8	27.04	4.58
Full sample	0.39	9.86	6.31	58.8	24.64	3.35	32.06	19.05	40.54	4.99

Interestingly, there is not much complain about the workplace safety. More than 80 percent of the workers are satisfied with the workplace safety. We also asked if the workers think that they are offered training opportunities. About half of the craft and plant workers tend to disagree. The technicians and associate professionals are equally divided on this issue.

About 44 percent disagree that they are offered training opportunities and about 46 percent think otherwise.

5.8 Soft Skill of the Workers

As we argue in our conceptual note that soft skills are also important for the productivity of the firms. There are 15 questions and 3 questions for each trait, following the standard measures <https://openpsychometrics.org/printable/big-five-personality-test.pdf>. The questions are scrambled so that the workers don't understand what type of non-cognitive skill we are trying to elicit.

Extroversion

Extroversion is the personality trait of seeking fulfillment from sources outside the self or in community. High scorers tend to be very social while low scorers prefer to work on their projects alone. The mean value of extroversion for all workers is 10.60 out of 15. Note that professionals are the least extrovert. Surprisingly, the craft and plant workers score the highest (10.63) and sales workers the lowest (9.13).

Agreeableness

Agreeableness reflects how much individuals adjust their behavior to suit others. High scorers are typically polite and like people. All workers are more or less agreeable as the average score is 12.11 out of 15. There is not much difference across the occupations.

Managers tend to be slightly more agreeable than others.

Conscientiousness

Conscientiousness is the personality trait of being honest and hardworking. High scorers tend to follow rules and prefer clean homes. Low scorers may be messy and cheat others. We also observe very high level of conscientiousness as the average score is 13.7 out of 15. Professionals and managers report slightly higher conscientiousness – about 14.

Neuroticism

Neuroticism is the personality trait of being emotional. High scorers tend to have high emotional reactions to stress. They may perceive situations as threatening and be more likely to feel moody, depressed, angry, anxious, and experience mood swing. Low scorers tend to be more emotionally stable and less reactive to stress. Neuroticism is found to be very low for all workers - the average score is 4.79. This is slightly higher for the craft workers and technicians.

Openness to Experience

Openness to Experience is the personality trait of seeking new experiences and

intellectual pursuits. High scorers may daydream a lot (enjoy thinking about new and different things). Low scorers tend to be very down to earth (more of a ‘hear and now’ thinker). Consequently, it is thought that people with higher scores might be more creative, flexible, curious, and adventurous, whereas people with lower score might tend to enjoy routines, predictability, and structure. Openness to experience is moderate – the mean score is 7.52 out of 15. This score is the highest for the sales workers (8.38) and the lowest for the craft and plant workers (7.48).

Table 44: Five big personality tests

Occupations	Extroversion	Agreeableness	Conscientiousness	Neuroticism	Openness to Experience
	(1-15)	(1-15)	(1-15)	(1-15)	(1-15)
Managers	10.53	12.91	13.89	4.19	8.11
Professionals	7.88	12.38	14	4.25	7.75
Technician	10.55	12.43	13.4	4.72	7.63
Sales and clerk	9.13	12.13	13.75	3.88	8.38
Crafts and other	10.63	12.03	13.1	4.84	7.48
Full sample	10.6	12.11	13.17	4.79	7.52

CHAPTER 6: IMPACT OF COVID-19 ON ENTERPRISES AND WORKERS AND RECOVERY

6.1 Impact on the enterprise

Table 45: Impact on the enterprises

Period: 1 January 2020 – 31 March 2020				
	Large	Medium	Small	Full sample
No. enterprises	39	37	45	121
Employment	1947	785	623	3,355
Output per enterprise (million)	22	6	4	10
Period: 1 April 2020- 30 June 2020				
Employment	1782	659	514	2,955
Output per enterprise (million)	10	1	1	4
Period: 1 July 2020 – 30 September 2020				
Employment	2035	776	515	3,326
Output per enterprise (million)	21	5	3	10

In order to capture the impact of COVID-19 in 2020, we collect information for three quarters: January-March, April-June and July-September. Note that the first COVID-19 case was detected in early March and the spread of the infection was very little in March. Hence, we can use the first quarter as the pre-covid period. Compared to this pre-covid period, total output per enterprise dropped drastically from 10 million Taka to 4 million Taka in the following quarter of April-June. While the large firms experienced about 50 percent reduction of output, small firms saw about 75 percent reduction. Interestingly, medium size firms in our sample experienced the largest drop – about 83 percent. However, the reduction in employment is not as large as the reduction in output. Most of the firms retained their employees in the time of lockdown and subsequent months. Large firms shedded 10 percent of the employees while the medium and small firms' number of employees shrunk by 16 percent and 17 percent respectively. Overall, the firms were downsized by 12 percent in April-June 2020 compared to the past quarter.

However, data on the third quarter – July-September 2020 shows that the reduction in the size of the firms were actually temporary. The firms bounced back very strongly in the third quarter compared to the pre-covid period. Output per enterprise was only 29 million Taka short of the pre-covid period for the all enterprises. The large firms saw a 4.5 percent increase in employment in the third quarter, though the output fell short of 1 million compared to pre-covid quarter. The recovery of the medium size firms were also noteworthy. Short fall of output per firm in the third quarter was only 17 percent of the pre-covid period. However, the small firms took the hardest blow as the firms still produced 25 percent less of the pre-covid out in the third quarter. Recovery of employment is also slower for the small firms – still operating with the workers which is about 17 percent lower compared to the pre-covid period. Though the full sample shows the full recovery in terms of output, the impact varies with the size of the firms. The

smaller firms are worse off due to COVID-19.

6.2 Impact on the Workers

In order to capture the impact of COVID-19 on the workers, we collect monthly data from January to September retrospectively. This allows us to examine the variations in a number of indicators such as status of employment, salary, household income, loan, whether returned home, economic hardship, household expenditure, and level of anxiety. These indicators are also expected to vary by occupations. So, we report monthly value of all indicators for all five occupations separately.

Table 46: Impact of COVID-19 and monthly indicators (Managers)

Managers	Employed (%)			Salary	HH Income	Loan (%)		Returned Home (%)		Economic Hardship	Anxiety
	Fully	Partially	Not at all	Mean BDT	Mean BDT	Yes	No	Yes	No	(1-10) scale	(1-10) scale
January	100			18329.25	31430.19	1.89	98.1		52.8	3.94	2.66
February	100			18329.25	34826.42	3.77	96.2		50.9	4	3.34
March	98.1	1.89		18230.19	31331.13	3.77	96.2	5.66	47.2	4.75	6.23
April	47.2	41.51	11.32	13083.02	25333.02	9.43	90.6	28.3	26.4	5.92	7.87
May	50.9	37.74	11.32	13467.92	28387.74	9.43	90.6	24.53	30.2	6.02	7.79
June	88.7	5.66	5.66	16656.6	29435.85	5.66	94.3	9.43	43.4	5.66	6.79
July	96.2	3.77		17864.15	31662.26		100	3.77	49.1	5.28	6.26
August	100			18288.68	32916.98		100		52.8	5.13	5.66
September	100			18288.68	31213.21		100		52.8	4.98	5.43

Note: In the case of returned home, the category of “not applicable” can be calculated residually.

Table 45 is for the managers for six indicators. We use January and February data as our benchmark – pre-covid months. Consider employment first. This is a little drop of employment of managers in March 2020. We observe more than 50 percent drop of employment of the workers in April, the month of lockdown. About 42 percent was partially employed in the sense that they received partial salary. About 11 percent of the managers were not employed in April. Though there was lockdown in May, the employment picked up little (51 percent) and in June about 89 percent retained their employment. The workers were fully employed again in August and September.

The trend in salary followed the paths of employment. Monthly salary dropped by about 30 percent in April and May and then slowly picked up to reach the pre-covid period in August. We observe similar story for the household income. In January-February of 2020, about 2-4 percent of the workers borrowed money and this figure shot up to 9 percent in April-May.

About 28 percent of the managers returned to villages in April and 25 percent in May. All the managers have returned to work when the situation tended to normalize in August.

Now consider economic hardship and degree of anxiety of the managers. We asked the managers to scale the economic hardship on a 1-10 scale. The score was about 4 in the pre- covid months and increased to as high as 6 in May. The score then decreased gradually to reach 4.98 in September. It is important to note that though the degree of economic hardship reduced from the lockdown months, it is still above the pre-covid period. We then asked the managers to score the degree of anxiety on a 1-10 scale. We observe similar trend of economic hardship – though the degree of anxiety reduced in September, the score was still very high compared to the pre-covid months.

Table 47: Impact of COVID-19 and monthly indicators (Professionals)

Managers	Employed (%)			Salary	HH Income	Loan (%)		Returned Home (%)		Economic Hardship	Anxiety
	Fully	Partially	Not at all	Mean BDT	Mean BDT	Yes	No	Yes	No	(1-10) scale	(1-10) scale
January	100			18287.5	31262.5		100	0	50	4.63	2.63
February	100			18287.5	31262.5		100	0	50	4.75	2.75
March	100			18287.5	31262.5		100	0	50	6.13	5
April	75	12.5	12.5	16825	30637.5		100	0	50	7.75	8.5
May	100			18287.5	39746.88	12.5	87.5	0	50	7.88	8.88
June	100			18287.5	31262.5		100	0	50	7.75	8.38
July	100			18287.5	31262.5		100	0	50	7.13	7.88
August	100			18959.38	37340.63	12.5	87.5	0	50	6.63	7.38
September	100			18287.5	31262.5		100	0	50	6.38	7.25

Note: In the case of returned home, the category of “not applicable” can be calculated residually.

The professionals seemed to remain unscathed by COVID-19 (Table 46). The employment dropped from 100 percent in March to 75 percent in April and then went back to 100 percent again in May. We observe a slight reduction in salary and household income in April only. Incidence of borrowing occurred in May and August. None of the professionals went to villages. It is interesting to note that though the drop of employment and salary is very little compared to the managers, degree of economic hardship and anxiety are reported to be higher. Economic hardship and anxiety both increased in the month of lockdowns but did not drop much since then up to September.

Table 48: Impact of COVID-19 and monthly indicators (Technicians and Associate Professionals)

Technicians and Associate Professionals	Employed (%)			Salary	HH Income	Loan (%)		Returned Home (%)		Economic Hardship	Anxiety
	Fully	Partially	Not at all	Mean BDT	Mean BDT	Yes	No	Yes	No	(1-10) scale	(1-10) scale
January	100			17526.99	25333.43	3.61	96.4	0	49.4	4.04	2.36
February	100			17526.99	26130.42	4.22	95.8	0	49.4	4.1	2.98

Technicians and Associate Professionals	Employed (%)			Salary	HH Income	Loan (%)		Returned Home (%)		Economic Hardship	Anxiety
	Fully	Partially	Not at all	Mean BDT	Mean BDT	Yes	No	Yes	No	(1-10) scale	(1-10) scale
March	99.4	0.6		17520.96	25359.34	1.81	98.2	1.81	50.6	4.63	6.23
April	33.7	47.59	18.67	10781.63	17964.76	12.7	87.4	23.5	27.1	6.16	7.86
May	50	36.14	13.86	12815.99	21756.63	16.9	83.1	22.8	26.5	6.22	7.95
June	69.9	24.1	6.02	14759.82	22094.58	9.04	91	11.5	38	5.96	7.33
July	94.6	4.82	0.6	16941.14	26142.77	1.81	98.2	3.61	45.2	5.36	6.59
August	99.4	0.6		17508.92	26644.43	1.81	98.2	0	49.4	5.17	5.99
September	100			17526.99	25325	3.01	97	0	49.4	5.04	5.62

Note: In the case of returned home, the category of “not applicable” can be calculated residually.

Now consider technicians and associate professionals (Table 47). Though employment fully recovered by September to the pre-covid level, it dropped to 34 percent in April and 50 percent in May. A large share of the technicians and associate professionals were partially employed during these two months. These workers saw about 38 percent reduction of salary in the month of April which gradually increased to the pre-covid level in September.

Incidence of taking loan also increased in the lockdown period and then reduced to pre-covid level in September. About 23 percent returned to villages in April-May. Economic hardship and anxiety shot up in these lockdown months and anxiety was still above the pre-covid level in August-September by a large margin.

Table 49: Impact of COVID-19 and monthly indicators (Sales and Service workers)

Sales and Service workers	Employed (%)			Salary	HH Income	Loan (%)		Returned Home (%)		Economic Hardship	Anxiety
	Fully	Partially	Not at all	Mean BDT	Mean BDT	Yes	No	Yes	No	(1-10) scale	(1-10) scale
January	100			18687.5	32687.5	0	100	0	75	4.13	3.38
February	100			18687.5	30187.5	0	100	0	75	4.38	3.63
March	100			18687.5	31437.5	0	100	0	75	5	5.5
April	37.5	37.5	25	12250	23000	12.5	87.5	37.5	37.5	5.5	6.38
May	50	37.5	12.5	13312.5	26687.5	25	75	37.5	37.5	5.5	7
June	50	37.5	12.5	12375	24562.5	12.5	87.5	25	50	5.88	7.25
July	87.5	12.5		17625	32062.5	0	100	0	75	5.63	7
August	87.5	12.5		17625	36125	0	100	0	75	5.38	6.38
September	87.5	12.5		17625	31437.5	0	100	0	75	5.38	6.25

Now consider sales related workers (Table 48). About two-thirds of the sales related workers were not fully employed in April, including 25 percent of out-of-work workers. Salary also reduced substantially by one-third and gradually increased, though not to the

level of pre-covid. One-fourth of the sales related workers took loan in May. About 38 percent of the workers returned home in April and May and they all returned in July. The score of economic hardship and anxiety are the highest in June, unlike other professions.

Table 50: Impact of COVID-19 and monthly indicators (Craft workers & plant operators)

Craft workers & plant operators	Employed (%)			Salary	HH Income	Loan (%)		Returned Home (%)		Economic Hardship	Anxiety
	Fully	Partially	Not at all	Mean BDT	Mean BDT	Yes	No	Yes	No	(1-10) scale	(1-10) scale
January	99.6	0.08	0.31	11700.68	19149.2	3.03	97	0.08	42.2	4.4	2.74
February	99.8	0.23		11733.31	19107.4	3.19	96.8	0.08	42.2	4.49	3.31
March	99.1	0.62	0.31	11696.64	19295.87	4.82	95.2	1.71	40.5	4.99	5.96
April	24.6	46.93	28.52	6003.438	12629.74	14.5	85.6	23.2	19.4	6.46	7.61
May	36.2	32.4	31.39	7015.86	14450.06	15.9	84.1	22.3	20.1	6.59	7.79
June	72	18.26	9.71	9724.897	16546.91	7.46	92.5	10.1	32.3	6.27	7.24
July	96.6	2.64	0.78	11664.15	19316.67	4.43	95.6	2.18	40.2	5.75	6.56
August	99.2	0.85		11807.74	19477.27	2.33	97.7	0.23	42.2	5.49	6.02
September	99.9	0.08		11809.68	19118.47	2.02	98	0.39	41.8	5.33	5.68

The monthly indicators for the craft and plant workers are presented in Table 49. Among the occupations, these workers experienced the largest drop of full employment in April – about 75 percent. About 47 percent were partially employed and 29 percent did not have any work in April. The situation improved drastically from June and reached almost pre-covid level in August. Salary of the workers almost halved in April and then gradually increased. About 14-16 percent took loan in April-May. 23 percent of the craft and plant workers went back to villages during lockdown months. Still a tiny fraction of the workers did not return to work in September. The score of economic hardship remained above 6 from April to June and then came down, though remained above the pre-covid level. The increase in anxiety in March culminated in May and remained as high as 6 till August.

CHAPTER 7: FINDINGS FROM FGDs AND KIIs

Experiences from two field visits

Table 51: Summary of field visits

Name of the areas visited	Bogura Light Engineering and electronics	Jessore Automobile and Light Engineering.
Duration of visits	07.01.2021 – 12.01.2021	08.03.2021 – 11.03.2021.
Stakeholders met	The officials of the BSCIC (Bangladesh Small and Cottage Industries Corporation), BITAC (Bangladesh Industrial Technical Assistance Centre), TTC (Technical Training Centre), Industry leaders/employers, industry workers NGO officials, government officials, etc.	The officials of the BSCIC (Bangladesh Small and Cottage Industries Corporation), Industry leaders/employers, industry workers NGO officials, government officials, etc.
Products	Tube well, centrifugal pump, liner-piston, various spare parts of power tillers and agricultural machinery and jute mills, tube well, lathe machine, 350 types of motor engine-based filters, food items and potteries, brick machine, stone breaking machine, paddy harvester, mixer machine, corn breaking machine, grass cutting machine, spice grinding machine, compressor, puli, bakery oven, boiler machine, etc.	Body of bus, body of truck, body of pickup van, trolley and covered van, brick machine, stone breaking machine, paddy harvester, mixer machine, corn breaking Machine, betel cutting machine, spice grinding machine, compressor, puli, bakery oven, boiler Machine, van spring, hope mould machine, etc.

We asked a number of questions to the FGD and KII participants in both Bogura and Jessore field visits. We extract the main gist of our discussion and describe below. Since the answers are very similar for both cases, we combine them together and provide under one heading.

I. Overall situation of business in the pandemic situation

Factories were closed for two months March and April, 2020 due to COVID -19. But they had enough work order during that period. Most of the firms of this area have reported to get back to the pre-COVID production levels, particularly the larger ones. Retaining workers during the pandemic has not been a problem. But there are some problems of raw materials as they pointed out. The industries and factories of this area are mostly dependent on the raw materials imported from China. Imports of raw materials have been disrupted and consequently production cost has been increased. The smaller enterprises are facing the crisis of finance, as they complained that they are not getting the support from COVID-19 stimulus package.

II. Overall assessment of the skill level of the workers

The employers of industries from this area do not think the skill gap and skill shortage as the biggest challenge. They think they are capable enough to train their workers according to their needs. Since these trades have a long apprentice period, which is very demanding and laborious, a huge number of potential workers for these industries are going to the transport

sector as driver of motorized vehicles. Some of them are migrating to Dhaka to search for better works. So apprenticeship is not taking place at satisfactory level, according to their views. They also complain about the weak linkages between the industry and public training institutions. While public training institutions have all the necessary technology, adequate training equipment, training environment and training staff, they are not establishing linkages with industries which is important for ensuring the implementation of Technology-based training. Instead of providing training through some ad-hoc projects, the associations suggest that government may take initiative to make public training institutions more functional, efficient and responsive to the local needs.

III. Whether the industry can expand their business without skilling up their workers. If so, why? If not, why not?

The industry people of this area think that they will be able to expand their business without skilled workers if they operate the business with the existing technology they are using now. Because they think they are capable to train the workers in a short period. But if they want to upgrade their businesses with modern technology, then up-skilling of workers and the managers is necessary. Most of the manufacturers have little information about the process of adopting of new technology, the business models and marketing strategies. They are not sure if they can compete with China if they start producing higher end products

IV. 5 occupations where skill shortage/gap is the highest (according to their view)

When asked this question in the FGDs, the responses did not vary much as they produce very similar type of products using similar technologies. Five occupations with highest skill shortage/gap in Bogura are: Welder, lathe machine operator, CNC operator, Gas cutting, and milling machine operator.. In the case of Jessore, these occupations are: operators for shaper machine, fitter, milling operator, welder, lathe machine operator

V. Will the association be willing to fund (full or partial) workers' training? If not why? Under what condition will they, if any?

For the existing technology, they do not need external help, as they opined. However, they are willing to fund for the training on more sophisticated technologies if the trainings are provided in accordance with their practical needs – e.g., CNC (Computerized and Numeric Controlled), PLC (Programmable logic controller), etc.

VI. Their views on the effectiveness of on-job training vs. external training

They think on-job training is more practical and useful for them. External training, to some manufacturers, is a waste their time and resources as they do not yield any significant return. According to them, external trainings largely focus on theory and this does not equip the workers to solve the practical problems in the factories.

VII. Their views about the role of training institutes/TVETs with examples

The business leaders understand the necessity of the adoption of high-end technology. But institutes are not imparting training to utilize high technology. For example, BITAC

was established in 2010 with the aim of designing products and processes and develop skills for industrial sector. BITAC and TTC are running modern workshops that contain CNC machines, Boring Machine, Vertical Lathe Machine, Heat Treatment Machines and Wire Cut machines which can be used as the testing facilities for factories/industries of this area. BITAC and TTC can also provide the necessary testing and certification of heat treatment, hardness testing, hardening, carburizing, Rockwell hardness testing, etc. But these are not happening in Bogura or Jessore. The industry people complained that BITAC being a modern light engineering workshop, takes part in the tender as competitor of local private firms of this sector. According to them, role of BITAC has shifted from becoming a facilitator of technology, design, training and innovation to a business oriented organization.

VIII. Why do they think there is no TVET-industry linkage?

There is no functional TVET-industry linkages in these two clusters. According to them, the course curriculum of TVET are not appropriate for the requirement of industry. They just follow the syllabus prepared by the head office which is not in line with the demand of industry.

IX. Views about the role of local/central government in skill development

The role of local government in promoting the local industries has not been found very effective. According to the associations, the interests of the local government are about tax, VAT and other regulations.

X. Views about automation

Their overall views about automation were somewhat dismissive. While they recognize the fact that automation is the future of this industry like in developed countries, they don't think it is happening in their lifetime - welding, gas cutting, foundry, forage, etc. will not be automated sometime soon. They are not concerned about the displacement of the workers due to adoption of new technology. Rather they think that machineries and technology will attract the educated workers in this sector and this increase their productivity and profits.

CHAPTER 8: RECOMMENDATIONS

8.1 General Recommendations for skill development in the country

I. Broader Definition of Skill is Required

As we know there are various types of skills such as cognitive, non-cognitive or soft, and technical skills. These three are the important determinants of the individual earnings. Moreover, the distinction between transferable (general) and non-transferable (occupation or task specific) skills helps justify government interventions. Understanding and recognition of the importance of different types of skills is central to designing an overarching implementable framework for skill development. It is important to note that NSDP 2011 defines Skills development “as the full range of formal and non-formal vocational, technical and skills based education and training for employment and or self-employment” (NSDP, 2011). That is, the definition is very narrow and focuses only on the technical skill, ignoring the cognitive and soft parts of it. It is also empirically established that the level of technical skill acquisition critically hinges on the level of cognitive abilities. Therefore, it is essential to define skills with a larger scope by including its all aspects.

II. Skill Acquisition is a Life Long Learning

The concept of lifelong learning entails the creation of opportunity for learning and skill acquisition at any age of life. Being a central theme of SDG4, it also helps guide the skill development strategy of a country. Any person at any age should be able to learn something new and it is the responsibility of the government to create the enabling environment for it. The education ecosystem that supports the lifelong learning promotes early childhood development, adult literacy and training, no entry barrier to general education and TVET based on age, seamless movement between general and vocational education, etc.

III. Clear Understanding of How Skill is Formed

What constitutes skills? What makes a welder a proficient welder? Cognitive skills earned at the primary and secondary level, off-job training at training institute, on job training, experiences, etc. matter in producing a skilled welder. That is, understanding of the skill production function - the factors and the process that contribute to skill production, is essential for designing the skill development framework. Hence, the role of vocational training cannot be seen in isolation; it has to be embedded in the overall education system of the country. Without solid foundation in the primary level, we cannot expect better outcome in the secondary level and similarly, sound primary and secondary training lays the foundation for skill accumulation in the vocational education as well as in the tertiary level. ‘Skills beget skills’, though sounds like a catch-22 problem, - is the main mantra for any skill development strategy.

IV. Alignment of Education and Skill Development Policies with Industrial Policy and Long Term Plans

Every developing country has an aspiration and plan on how to grow and how to grow fast. Hence the policy makers envisage the share of manufacturing along the transitional path

and the sectors that will push the manufacturing growth. This projection is laid out in the Five Year Plan and the Industrial Policy elaborates the details of the route to higher industrial growth in Bangladesh. One of the critical elements required for the industrial growth is the human capital. That is, the plan for developing human capital has to be aligned and consistent with the industrial policy and growth strategy. Education and skill development policies cannot be stand-alone documents. Since the country aspires to become an upper middle country by 2030, it is essential to invest in human capital to help grow the thrust sectors as defined in the industrial policy. The policies that highlights the trade-offs between STEM (Science, technology, engineering and mathematics) vs. other streams, between general and vocational education, between tertiary vs. non-tertiary education have to be aligned with the industrial policy and the projected growth path of the country.

V. Sector Wide Approach (SWAp) for Secondary Education and TVET

The discussions have started to adopt sector wide approach for secondary and TVET education. The lessons learnt from the SWAp of the primary education and health sector can be applied to the secondary education and TVET to enhance the efficiency of the use of resources and to avoid duplications through better coordination.

VI. Informed Agent: Easily Accessible Information on Skill Development Opportunities

The ideal framework for skill development should create such an enabling situation so that all can make informed decision about the choice of education stream, disciplines and career. Is the rate of return of vocational education is higher compared to comparable groups who choose general stream? How many students who pass SSC and HSC are aware of the vocational stream, particularly in the rural areas? How many are they aware of the job prospects of different education stream? Anecdotal evidence suggest that there is a severe lack of awareness about the vocational education and its job prospects. While the government is expanding the reach of the vocational education, the need for demand side interventions such as social campaign is absent in the current policy debate on education and training. Therefore, creation of informed citizens about the full spectrum of opportunities of education and skill development is a precondition for the human capital development strategy of the country.

VII. Social Recognition for Vocational Education

How society values a graduate of the vocational education also determines the success of these institutions and the overall skill development interventions of the government.

Therefore, it requires to invest in image building of these professions.

VIII. Data to Track Sector Specific Skills and Skill Mismatch

Unfortunately, we don't have the data to track the skill level and skill mismatch at the sectoral level. In order to keep track of the progress and monitoring we need quality data to be generated at regular basis. In order to monitor the progress of SDG-4, we also require such data. To this end, BBS can take the initiative to conduct separate survey on skills or can include a module in the existing labor force survey. A subsample can also focus on cognitive and non-cognitive abilities.

8.2 Sector Specific Recommendations

I. Greater access to finance for acquiring new technology and up-skilling

Access to finance has been identified as the major challenge for skill up-gradation of the light engineering and electronics sector. The business leader pointed out that they do not get the necessary finance especially when they need a large amount of capital for upgrading or expansion of the business. Since banks also do not provide loan without mortgage, a third party guarantee by the government or the association might help address this problem. Short grace period and short tenure for repaying the loan are the two other challenges faced by these sectors. Instead of banks, the businesses prefer MFIs as the source of credit. But the size of loan and short tenure make the borrowers use the loans less efficiently. The business leaders asked for a separate body for SME loans disbursement - similar to PKSF. They are not at all satisfied with the role of the SME Foundation as far as access to credit is concerned.

II. Common Facilities Centers (CFCs)

This is something that all business leaders recommended. The associations argue for cluster based development and argue for the need for a CFC for each cluster for technology transfer and skill development. The supporting facilities may also include supports of marketing, raw materials supply, order processing, production, value addition, training, and testing facility laboratory, etc. Putting all these facilities together and providing support to industries can be made possible through establishing CFCs. Establishing CFCs for a small entrepreneur is highly expensive and challenging and hence public intervention is required.

III. Fostering industry-TVET linkage

We found in our study that the linkage between industry and TVET is very low. Enterprises hardly send their employees to the training institutes and training institutes, largely public ones, hardly reach out to the industry. While there is a law that certain fraction of the workers must be apprentice, the enterprises hardly follow this law and there is no monitoring from the government. An implementable framework is required to foster industry-TVET linkages.

IV. Greater access to institutional training

Our findings show that the floor workers of the light engineering sector has hardly any institutional training. The workers learn as they work. While the on-job training is important, it may limit the growth of the skill sets of the workers because of the lack of theoretical knowledge. Special courses can be introduced for the workers who are already

in the jobs to complement their skill acquired through learning by doing. This course should be certified by BTEB or NSDA. All floor workers of the light engineering sector should be brought under a program for up-skilling and reskilling.

V. Preparation for embracing 4IR

While the industry leaders are not worried about the automation and the threat that 4IR poses, it is important for the government to start preparation for this transition. According to a study conducted by the Aspire to Innovate (A2i), about 5.5 million people is likely to lose their jobs in the next 10 years in Bangladesh due to the 4IR. However, it is also expected that this new wave of technological revolution will create about 10 million jobs.

Some of the sectors where most of the jobs will be created are Industrial Robotics control, automated packaging, Computer Aided Design (CAD) and Computer Aided Manufacturing (CAM), 3D printing, internet of things, cyber security, and big data analytics, etc. This has serious implications for the light engineering sectors as this sector will experience a transformation from labor intensive sector to capital intensive ones in the near future in order to sustain in the global competition.

8.3 Recommendations for SEIP for designing the second phase

I. Greater focus on mid-level to advanced courses

So far SEIP has conducted 139 programs and most of them are equal to or below the level of NTVQF 2. These basic courses are also being offered the private and NGO sectors. While there is a huge demand for such basic courses, the comparative advantage of SEIP lies in offering mid-level to advanced courses.

II. Technical vs. management trainings

SEIP has partnered with Bangladesh Bank and other institutions and is offering management training. While the management training for the managers is critical more any businesses, we believe SEIP is meant to offer technical training and this is where its comparative advantage lies.

III. Soft vs. hard skills

Soft skill is now recognized as a major input of workers' skill sets. This is not necessarily the management training. SEIP can consider introducing teaching soft skills to the workers in the next phase.

IV. Technical institutes should be the prime vehicle for delivery

SEIP is now partnering with business associations, training institutes, Bangladesh Bank, universities and private sector. While this experimentation is good for learning about which works best, we believe strengthening of the current institutions mandated to impart training should be the key delivery vehicle of the trainings by SEIP. There is no need to create new institutions or any temporary bodies to impart training.

V. Fresh trainees vs. on-job trainees

Discussion with the SEIP personnel reveals that a large share of the trainees are fresh

ones who are not from any industry. It is important to know which target group results in better outcomes in terms of up-skilling, reskilling and career growth of the workers. For example, in the case of construction sector, most of the workers are temporary workers and there is little incentives for the firms or the labor contractor to arrange training for them. In this case, fresh trainees could be the focal points. On the other hand, in the case of light engineering, on-job trainees are the right target group. Combination of off-job and on-job training will be very effective to ensure skills acquisition of fresh trainees

VI. Partnership with industries

While SEIP works with the business associations, SEIP can partner with large businesses as they operate on the frontier of technology. What these large conglomerates are doing now will define the paths that will be followed by other industry in the future. It is essential to understand the types of training these large enterprises are imparting to their workers and how these type of trainings can be customized to offer for others.

VII. Ranking of training institutions

The potential trainees don't have much information about the quality of the training institutes. SEIP can take initiatives to create a ranking of these institutions similar to universities based on quality of teacher, course curricula, job market outcomes, etc. The ranking will also inform the potential students to learn about the quality of the training institutes and make informed decisions.

VIII. Offering scholarship to the trainees

Our field survey reveals that many potential fresh trainees cannot take part in the program due to their other income earning activities. If they are compensated for their time, even partially, this may increase enrollment and induce greater learning.

IX. Demand side interventions

SEIP should seriously think of the demand side interventions regarding information provision. Our field visits suggest that many potential trainees do not have any information about the training offered by many institutes. Information campaign can be an integral part of the second phase of SEIP.

X. Partnering with international training institutions

There are many international training institutes in Korea, Malaysia, Singapore and Middle-east. Collaboration with these institutes will their certification can help increase the demand of workers from Bangladesh to these countries.

Appendix

Table 52: A1 Desired level of qualification of the workers (ISCO 2-digit)

Sl. No.	Occupations (ISCO 2-digit)	Total Employment	Desired qualification (Science)	Desired qualification (Arts)	Desired qualification (Commerce)	No preference for the field of education	Desired level of education	Desired level of experience at entry
			(%)	(%)	(%)	(%)	Years	Years
1	Managing Director	30	35.29	5.88	29.41	29.41	15.41	7.29
2	Manager/President/Production	153	18.85	7.38	47.54	26.23	13.93	4.93
3	Electrical Engineer/Molding Engineer	7	100				12	6
4	Accountant/CA Accountant/Brand Promotion officer	23			100		14.69	4.31
5	Foreman/Engineer/Supervisor/Technician	232	42.73	0.91	2.73	52.73	8	4.95
6	Executive/Admin officer	6	50			50	10.83	5
7	Computer operator	3	50		50		14	4
8	Storekeeper	3			100		13.5	4
9	Cook man/Caretaker	4				100	4.75	3
10	Salesman/Marketing Man/Commercial	23	12.5	12.5	31.25	43.75	12.94	3.38
11	Security/Gateman	61				100	7.88	3.21
12	Wardrobe man	12				100	7	5
13	Painter mechanic/Varnish mechanic	11				100	7.6	2.4
14	Boring-man/Welder/Welder/Fitter/Drilling-man/ CNC and CAD-CAM operator	1819	20.51	0.51	0.34	78.12	9.91	3.88
15	Electrician	34	30.77		7.69	53.85	10.69	2.77
16	Quality In charge/Packaging man	21	28.57			71.43	12.14	2.71
17	Painting Machine operator/Cold heading	190	13.89		1.39	84.72	10.33	3.85

Sl. No	Occupations (ISCO 2-digit)	Total Employment	Desired qualification (Science)	Desired qualification (Arts)	Desired qualification (Commerce)	No preference for the field of education	Desired level of education	Desired level of experience at entry
			(%)	(%)	(%)	(%)	Years	Years
18	Driver/Power pressman/Hydraulic pressman	20				91.67	8.08	4.75
19	EDM machine/Iron man laundryman	4				100.00	7.50	1.50
20	Office Assistant/Cleaner/Peon	6			20.00	80.00	8.20	1.60
21	Helper/Trimming machine operator	462	1.82	0.91		96.36	7.50	1.61

Table 53: A2 Actual Qualification (ISCO 2-digit)

Sl. No	Occupations (ISCO 2-digit)	Total Employment	Present qualification (science)	Present qualification (Arts)	Present qualification (Commerce)	No field of education	Present level of education (Years)	Present level of Experience (Years)
			(%)	(%)	(%)			
1	Managing Director	30	29.41	29.41	23.53	11.76	12.88	9.59
2	Manager/President/Production	153	17.21	40.16	20.49	19.67	12.38	5
3	Electrical Engineer/Molding Engineer	7	50			50	6	1.5
4	Accountant/CA Accountant/Brand Promotion officer	23		12.5	62.5	18.75	13.31	5.81
5	Foreman/Engineer/Supervisor/Technician	232	5.45	14.55		79.09	7.95	5.46
6	Executive/Admin officer	6	50		50		14	5.5
7	Computer operator	3		50	50		11	3
8	Storekeeper	3		50			15	1.5
9	Cook man/Caretaker	4				100	3.5	5.5
10	Salesman/Marketing Man/Commercial	23	12.5			87.5	11.31	3
11	Security/Gateman	61				95.83	5.83	4.42
12	Wardrobe man	12				100	5	4.33
13	Painter mechanic/Varnish mechanic	11				100	5	5.8

Sl. No	Occupations (ISCO 2-digit)	Total Employment	Present qualification (science)	Present qualification (Arts)	Present qualification (Commerce)	No field of education	Present level of education (Years)	Present level of Experience (Years)
			(%)	(%)	(%)			
14	Boring-man/Welder/Welder/Fitter/Drilling-man/ CNC and CAD-CAM Operator	1819	1.37		0.34	95.38	8.56	4.82
15	Electrician	34			15.38	84.62	2.36	5.54
16	Quality In-charge/Packaging man	21		28.57		71.43	2.85	3
17	Painting Machine operator/Cold heading	190	2.78			87.5	2.52	4.29
18	Driver/Power pressman/Hydraulic	20		8.33	8.33	83.33	2.23	5.25
19	EDM machine/Iron man laundryman	4				50	4.24	7.5
20	Office assistant/Cleaner/Peon	6	20	20		60	5.22	2
21	Helper/Trimming machine operator	462	0.91			98.18	5.04	1.13

Table 54: A3 Horizontal and vertical mismatch (ISCO 2-digit)

Sl. No	Occupations (ISCO 2-digit)	Total Employment	Vertical mismatch (Years of Schooling)			Horizontal mismatch (field of study)
			Total	Over Qualification	Under Qualification	
1	Managing Director	30	76.5	0	100	54.55
2	Manager/President/Production manager	153	62.3	19.4	80.6	60.49
3	Electrical Engineer/Molding Engineer	7	50	0	100	100
4	Accountant/CA Accountant/Brand Promotion officer	23	43.8	0	100	62.25
5	Foreman/Engineer/Supervisor/Technician	232	90	11.11	88.89	44.23
6	Executive/Admin officer	6	0		100	100
7	Computer operator	3	100	25	75	100
8	Storekeeper	3	0	0	100	100
9	Cook man/Caretaker	4	100	25	75	0
10	Salesman/Marketing Man/Commercial Officer	23	56.3	0	100	41.67
11	Security/Gateman	61	50	8.33	91.67	0
12	Wardrobe man	12	100	0	100	0

13	Painter mechanic/Varnish mechanic	11	80	0	100	0
14	Boring-man/Welder/Welder/Fitter/ Drilling-man/ CNC and CAD-CAM operator	1819	89.2	12.84	87.16	20.8
15	Electrician	34	92.3	16.67	83.33	41.67
16	Quality In-charge/Packaging man	21	100	28.57	71.43	28.57
17	Painting Machine operator/Cold heading machine operator	190	88.9	14.06	85.94	12.86
18	Driver/Power press man/Hydraulic press man	20	83.3	20	80	8.33
19	EDM machine/Iron man laundry man	4	100	50	50	0
20	Office assistant/Cleaner/Peon	6	100	25	75	20
21	Helper/Trimming machine operator	462	100	20.93	79.07	3.64

Table 55: A4 Difficulties in filling up vacancies (ISCO 2-digit)

Sl. No	Occupations (ISCO 2-digit)	Total Employment	Difficulties in filling up vacancies (1 to 10 scale)	If a vacancy is occurred/posted/advertised today, how long will it take to fill up the position?			
				Almost instantly	Less than a week	More than a week and less than a month	A month or more than a month
1	Managing Director	30	7.88	6.25			93.75
2	Manager/President/Production manager	153	6.35	0.83	11.67	15.83	71.67
3	Electrical Engineer/Molding Engineer	7	7			50	50
4	Accountant/CA Accountant/Brand Promotion officer	23	5.53			26.67	73.33
5	Foreman/Engineer/Supervisor/Technician	232	6.88		3.64	42.73	53.63
6	Executive/Admin officer	6	6.5				100
7	Computer operator	3	5.5			50	50
8	Storekeeper	3	5.5				100
9	Cook man/Caretaker	4	4.33			100	
10	Salesman/Marketing Man/Commercial Officer	23	6		12.5	37.5	50
11	Security/Gateman	61	4.63	8.33	50	25	16.67
12	Wardrobe man	12	6.67		33.33	33.33	33.34
13	Painter mechanic/Varnish mechanic	11	6.2		20	60	20
14	Boring-man/Welder/ Fitter/Drilling-man / CNC and CAD-CAM operator	1819	6.17	0.86	15.15	60.93	23.06

15	Electrician	34	6	7.69	23.08	30.77	39.46
16	Quality In-charge/Packaging man	21	5.5	16.67	16.67	50	16.66
17	Painting Machine operator/Cold heading machine operator	190	5.77	5.71	37.14	40	17.24
18	Driver/Power press man/Hydraulic press man	20	5.08		8.33	75	16.67
19	EDM machine/Iron man laundryman	4	8			100	
20	Office assistant/Cleaner/Peon	6	4.6		20	40	40
21	Helper/Trimming machine operator	462	4.51	22	36	28	14

Table 56: A5 Growth projection of the workers by occupations (ISCO 2-digit)

Sl. No	Occupations (ISCO 2-digit)	Total Employment in 2019	Growth of the number of works in next 5 to 10 years					Percentage increase in 2023 relative to 2019	Percentage increase in 2025 relative to 2019	Percentage increase in 2030 relative to 2019
			Negative growth	No growth	Moderate growth	High growth	Very high growth			
1	Managing Director	30		93.75	6.25			0	3.33	6.67
2	Manager/President/Production manager	153		34.71	63.64	1.65		15.03	56.86	113.07
3	Electrical Engineer/Molding Engineer	7			100			42.86	114.29	200
4	Accountant/CA Accountant/Brand Promotion officer	23		12.5	87.5			34.78	91.3	152.17
5	Foreman/Engineer/Supervisor/ Technician/	232		3.64	90	5.45	0.91	36.64	93.97	181.47
6	Executive/Admin officer	6	50		50			-33.33	33.33	66.67
7	Computer operator	3			50	50		33.33	100	166.67
8	Storekeeper	3			100			33.33	66.67	166.67
9	Cook man/Caretaker	4			100			100	150	250
10	Salesman/Marketing Man/Commercial Officer	23		12.5	56.25	31.25		65.22	160.87	286.96

11	Security/Gateman	61		16.67	79.17	4.17		16.39	45.9	81.97
12	Wardrobe man	12			66.67	33.33		41.67	58.33	125
13	Painter mechanic/Varnish mechanic	11			75	25		18.18	72.73	145.45
14	Boring-man/Welder/Fitter/Drilling-man/ CNC and CAD-CAM Operator	1819	0.69	7.4	63.68	28.06	0.17	38.32	82.19	149.37
15	Electrician	34		8.33	75	16.67		35.29	100	176.47
16	Quality In-charge/Packaging man	21		16.67	33.33	50		-4.76	47.62	114.29
17	Painting Machine operator/Cold heading machine operator	190		10	67.14	21.43	1.43	27.89	76.32	143.16
18	Driver/Power pressman/Hydraulic pressman	20		8.33	91.67			30	60	140
19	EDM machine/Iron man laundryman	4			100			75	150	250
20	Office assistant/Cleaner/Peon	6		40	60			0	16.67	66.67
21	Helper/Trimming machine operator	462	2.97	3.96	39.6	45.54	7.93	35.71	80.52	142.64

Table 57: A6 Technical and vocational of the workers arranged by employers: Managers

Managers Category of Training	Duration of the course (%)		Certified (%)	BTEB Certified (%)	Satisfaction scale of 1 to 10
	3-4 weeks	1-3 months			
Engineering & Technical	33.33	66.67	100	100	8
Manufacture & Crafts	100		100	100	6
Full sample	50	50	100	100	7.5

Table 58: A7 Technical and vocational of the workers arranged by employers: Technicians and associate professionals

Category of Training	Duration of the course (%)				Certified	BTEB Certified	Satisfaction
	< 1 week	1-2 weeks	1-3 months	4-6 months	(%)	(%)	scale of 1 to 10
Engineering & Technical		33.33	66.67		100	33.33	8.5
Agriculture related	100				100	0	7
Manufacture & Crafts	100				100	0	7
Service and creative courses							
Others	50			50	50.00	50.00	7
Full sample	42.86	14.29	28.57	14.29	57.14	28.57	7.57

Table 59: A8 Technical and vocational of the workers arranged by employers: Craft workers & plant operators

Category of Training	Duration of the course (%)					Certified	BTEB Certified?	Satisfaction
	< 1 week	1-2 weeks	3-4 weeks	1-3 months	4-6 months			scale of 1 to 10
Engineering & Technical	6.25	31.25	18.75	31.25	12.5	62.5	53.33	7.44
Agriculture related								
Manufacture & Crafts	16.67			83.33		66.67	66.67	
Service and creative courses				100		100		8
Others	25	37.5		37.5		87.5	87.5	7.13
Full sample	12.9	25.81	9.68	45.16	6.45	67.74	63.33	7.45

Table 60: A9 Course Wise Training Summary of Bangladesh Engineering Industry Owners Association & Tranche TR-1

SL.	Course Name	Target	Enrollment			Assessment				Job Placement		
			Total	Net	Female	Total	Female	Absent	Dropout	Total	Female	Percent
1	Lathe Machine Operation	92	56	48	-	48	-	-	8	26	-	54.17
2	Welding	118	79	75	1	74	1	1	4	51	1	68.92

SL.	Course Name	Target	Enrollment			Assessment				Job Placement		
			Total	Net	Female	Total	Female	Absent	Dropout	Total	Female	Percent
3	Master Craftsmanship	7,211	7,368	7,330	10	7,320	10	10	38	6,379	7	87.14
4	CAD/CAM Design	108	108	100	9	99	9	1	8	50	6	50.51
5	CNC Operation	40	40	34	-	33	-	1	6	16	-	48.48
6	Business Accounting	66	66	56	16	55	16	1	10	22	6	40
7	Business Management	64	64	55	10	54	10	1	9	18	2	33.33
8	Refrigeration & Air Conditioning	195	170	160	17	152	17	8	10	115	10	75.66
9	Electrical	446	403	353	31	350	31	3	50	256	14	73.14
Total		8,340	8,354	8,211	94	8,185	94	26	143	6,933	46	84.7

Table 61: A10: Course Wise Training Summary of Bangladesh Industrial Technical Assistance Center & Tranche TR-1

SL.	Course Name	Target	Enrollment			Assessment				Job Placement		
			Total	Net	Female	Total	Female	Absent	Dropout	Total	Female	Percent
1	Welding and Fabrication	1,080	1,022	891	34	868	34	23	131	680	21	79.53
2	Machine Shop Practice/Machine Tools operation/Machinist	1,080	1,105	1,002	108	979	108	23	103	806	72	82.84
3	Electrical/Electrician	1,080	1,148	1,085	296	1,073	296	12	63	840	227	78.8
Total		3,240	3,275	2,978	438	2,920	438	58	297	2,326	320	80.37