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Mapping and Analysis of Growth-Oriented Industrial Sub-Sectors and their Skill Requirements in Bangladesh

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Abbreviations and Acronyms

BGMEA	: Bangladesh Garment Manufacturers and Exporters Association
BMET	: Bureau of Manpower, Employment and Training
BTEB	: Bangladesh Technical Education Board
CBT	: Competency-based training
CSDC	: Chittagong Skills Development Centre
DTE	: Directorate of Technical Education
DWT	: Dead Weight Tones
MOE	: Ministry of Education
NCSDT	: National Council for Skills Development and Training
NGOs	: Non-Governmental Organizations
PIU	: Project Implementation Unit
SWCs	: Sector working committees
TTTC	: Technical Teachers Training College
TVET	: Technical and Vocational Education and Training
VTTI	: Vocational Teachers Training Institute

Chapter 1

Introduction

1.1 Background

Bangladesh aspires to achieve the status of a middle income country within the next decade. The other development goal of the country is to accelerate the pace of poverty reduction. Achievement of these objectives hinges upon a further acceleration of GDP growth as well as a faster rate of structural change in the economy, both in terms of output and employment. Higher growth of industry and service sectors becomes important in that context. Growth of these sectors can help poverty reduction through the creation of employment opportunities, and especially, employment with higher levels of productivity and returns.

In order to achieve higher growth of output and productive employment in industry and service sectors, there is a need to support the growth of sub-sectors which are competitive and have potentials for sustained growth and export. Support to such sub-sectors can be provided through policy measures targeted to ensure infrastructure and environment for growth and through improvement of the quality of the labour force.

With high population density, Bangladesh is considered to possess an elastic supply of labour. Agriculture cannot absorb the growing labour force in the rural areas, and underemployment rate is high. But the quality of labour force released from agriculture and rural areas may not be suitable for employment in non-farm sectors, especially in industrial sub-sectors that use advanced technology and thus require skilled workers.

The Government is, therefore, adopting policies and programmes for the development of human capital. As part of such programmes, reform of 'technical and vocational education & training' (TVET) is receiving attention, and a project on TVET reform has been taken up. This project intends to implement pilot initiatives in the high-skill intensive economic sub-sectors and targets sub-sectors with high competitiveness, growth potential and export orientation. The objectives of realizing the growth potential and improvements in competitiveness require a labour force with good quality education and training. To develop appropriate training for the available labour force, the demand for trained labour force and the type of training required must be assessed.

The study detailed in this report intended to identify (i) sectors which are competitive and demonstrate growth potential, and (ii) the type of skills that will be required by these sectors in the coming years. It is expected that the findings will provide guidance for the TVET Reform Project, especially in choosing the economic sub-sectors to be targeted.

For the purpose of selecting sub-sectors of the kind mentioned above, an analysis was undertaken of the pattern of growth, export performance, employment, and productivity of manufacturing sub-sectors.

The next step was then to assess the skill needs of the selected manufacturing sub-sectors and the ICT sub-sector within service industries. Although the purpose of the study was to select some

sub-sectors that could be targeted for skill development, the study also provided an in-depth analysis of the structural change and performance of all selected manufacturing sub-sectors so as to provide further information for use by other projects and policy initiatives in Bangladesh more broadly.

1.2 Organization and Scope of the Study

Chapter 1 provides the background and objectives of the study. Chapter 2 describes the data sources used in the study. Chapter 3 provides a review of recent studies on competitiveness and productivity of non-farm sub-sectors. Chapter 4 describes the criterion and steps used for the selection of sub-sectors for further skill development. Chapter 5 examines the growth performance, competitiveness and productivity of manufacturing sub-sectors. This analysis includes:

- Δ Changes in the importance of various sub-sectors in terms of share of total industrial value added and employment.
- Δ Growth of value added and employment.
- Δ Factor productivity and technical progress (analysis of Total Factor Productivity).

In addition, the enterprise survey will collect data on cost of production of specific items which will be examined to throw light on the competitiveness of various sub-sectors.

Chapter 8 will examine some aspects of gender dimensions of employment in manufacturing. Focus will be on

- Δ difference in the share of female employees among sub-sectors,
- Δ changes in gender composition of employment.

Analysis of the share of female employees in each sub-sector will provide an idea about the direction of intervention needed to enable skill generation among women and to ensure better paid employment for them.

Chapters 9 to 12 will examine the skill composition and future skill demand in the sub-sectors.

The analysis in Chapters 3 to 8 is limited to manufacturing sub-sectors.¹

¹ Construction and RMG sub-sector will be treated separately. Chapter 8 of the present study will include one sub-sector from services; and ICT has been pre-selected for that purpose.

Chapter 2

Sources of Data

This study involved both desktop research and data collection from interviews conducted with a sample of 36 enterprises.

2.1 The Census of Manufacturing Industries (CMI)

The CMI is the major source of manufacturing sub-sector level data which was used for most of the analysis related to the selection of sub-sectors. CMI provided data on almost all the relevant aspects of manufacturing such as production volumes, employment details, value of fixed asset, cost structures, value added etc.

However, the industrial classifications recorded in the CMI 2001-02 do not fully agree with those recorded in earlier series. Hence, several adjustments were made to make the figures comparable.

2.2 Other Sources of Secondary Data

Additional sources (other than CMI) were used to provide information on selected indicators of manufacturing growth. These included the Export Promotion Bureau, the Board of Investment and various business chambers. Information from these sources was especially useful for examining the direction of changes in the performance of sub-sectors after 2002, since the CMI stopped at that point. In addition, newspaper reports on new investment and export initiatives were also used as an additional source of material.

2.3 Enterprise Survey

A survey of selected enterprises has been carried out for this study. At least four enterprises from each of the eight selected sub-sectors have been covered in the survey in accordance with the TOR. In addition, the survey covered one more enterprise in each of textiles, pharmaceuticals, food manufacturing and furniture sub-sectors thus totaling a sample of 36 enterprises. Medium and large enterprises have been chosen for the survey.

Method of selection of enterprises: The industrial associations of the study sub-sectors were approached to recommend four enterprises for the survey on the basis of their levels of development and performance as high, medium and low in order to represent the sub-sector. In several instances, the recommended enterprises did not take part in the survey. Consequently, replacement of the non-participants was sought from the respective association, a situation which caused delays to the survey. Meanwhile, in order to meet survey deadline a few enterprises willing to participate in the survey were instantly selected and surveyed resulting in additional coverage of the survey.

Chapter 3

Review of Studies on the Performance of the Manufacturing Sector

This Chapter will review the recent studies on manufacturing sector and those providing sub-sector level disaggregation.

Ahmed et. al.'s study (2008) on promoting employment-intensive growth provides useful results based on CMI data, which include:

- Δ An analysis of capital intensity of the sub-sectors and the changes thereof;
- Δ The recent growth of employment and value added in sub-sectors with various employment elasticities.

In addition, the study has examined the prospects and problems of a few sub-sectors which can help policy formulation for the growth of these sub-sectors. The selection of sub-sectors for in-depth study was not based on a systematic criterion.

The above-mentioned study carried out an analysis of value added and employment growth for ten target sub-sectors. In addition it examined the recent changes in sub-sectors with varying elasticity of employment with respect to value added. The link between the elasticity and other indicators was found to be weak. For example, among those with high elasticity (and in fact in each of three elasticity ranges) some sectors experienced negative value added growth and/or employment growth. A direct assessment of employment elasticity for the extended period yields result for easy analysis of change. Moreover, the periods under comparison are 1996 to 2000 and 2000 to 2002. The latter is only one point comparison (since CMI 2001 is not available). Therefore, the 2000 – 2002 comparison will reflect only fluctuations rather than a trend change.

The important conclusions of the study which provides the rationale for more in-depth analysis and more comprehensive coverage of sub-sectors are as follows:

- Employment and value added growth were negative in several sectors (especially in some which are employment-intensive);
- Capital intensity (K/L) increased in a number of sub-sectors;
- A few industries achieved positive value added growth but experienced negative employment growth;

The conclusions raise many questions and provide a rationale for doing a more in-depth study with comprehensive coverage of the performance of manufacturing sub-sectors. For example, what are the implications of a rise in capital intensity? How does it affect employment growth and value added growth? Which sub-sectors are more export-intensive? For sub-sectors with

positive value added growth and positive employment growth, what has been happening to labour productivity? A similar question may be asked about sub-sectors with decline in employment. A major weakness of the study is the ad.hoc choice of sub-sectors, and the use of different sets in different analysis

Rahman et. al. (2007) examined the impact of trade liberalization on employment. In this context it compared three phases 1984 to 1990, 1991 to 1996 and 1996 to 2006. The study examined the structure of employment, underemployment and labour productivity and female labour force participation. The study used mainly two sources of data: Labour Force Survey and Census of Manufacturing Industry.

The study has correctly pointed out the problems of each of these data sources, and attempts have been made to correct the data. For example, LFS data has been corrected using a coefficient for change in age criterion (early LFS, up to 1996 used 10+ age as labour force, from 1999-2000 15+ age has been used). Change in extended vs usual definition has been corrected for 1990-91. Even after correction, the authors continue to express doubts, when some results are implausible (e.g. saying 'if the data is to be believed' ... etc.). Consequently, the issue of comparability of the pre-1996 LFS data with that of later years remains even after correction. The reason is that a correction based on a single coefficient may not capture the fact that the changes in definition are likely to result in changes in employment and underemployment in various sectors in different ways, and using a single coefficient for all correction may not be meaningful. Furthermore, the study has used only two digit sector classification in the analysis of productivity which limited the relevance of the data for this study.

Moreover, 1989 LFS has been based on 'extended definition' but this has not been corrected. As a result, the size of the labour force in that year is very large and LFPR of women is high. Using that labour force size, labour productivity has been calculated, which obviously shows a sudden bump and the large decline in productivity has not been matched by wage change.

There have been other methodological changes in LFS data. Without going in-depth into these differences between surveys, it is clear from the literature that one cannot compare the sectoral structure of employment, status of employment, underemployment etc across different sectors. Consequently, policy or program initiatives should not be based on the conclusions derived by the study from the LFS data.

Mustafiz et al (date?) also examined employment growth at aggregate level, for two categories of export oriented manufacturing: labour intensive and not-labour-intensive. Such aggregate treatment may not correctly reveal the link between current labour intensity and the prospects of employment growth. The definition of labour intensity has been chosen rather arbitrarily which affects interpretation of the rate of growth of employment in particular sub-groups. The difference in growth of employment among these groups actually highlights the need for disaggregated analysis at sub-sector level to see whether labour intensity is linked to employment growth and this will be carried out in the present study.

Mustafiz et. al (date?) found there was no relationship between the changes in the index of productivity and index of wage in the manufacturing sector as a whole. However, such a relationship should be examined for at least the major manufacturing sub-sectors.

Islam (2004) identified some industrial sub-sectors as ‘potential sub-sectors’ implying that these had prospects for growth. The study examined the growth of value added in the major (4 digit) sub-sectors. Data on the ‘decline’ and ‘rise’ of sub-sectors (at three digit level) classified into ‘labour-intensive’ and ‘capital-intensive’ groups was presented on the basis of percentage change in value added during 1991 to 95 and 1986 to 1990. Then the study proceeded to discuss the ‘potential sub-sectors’, although the criteria or basis for choosing these sub-sectors was not made explicit. The list includes both labour intensive and capital intensive (according to their own classification of sub-sectors). The source of data used for this classification were not referenced, and it is possible that the QIP growth and value added growth data are from different sources. Moreover, the definition of ‘labour-intensive’ has not been mentioned. Despite these shortcomings, since the results of value added growth in two periods show that some sub-sectors from each category are rising, labour intensity should not be considered a determining factor behind the growth.

The listed ‘potential sub-sectors’ in Islam (2004) were RMG, leather goods, fish and frozen food, pharmaceuticals, livestock and dairy industry.

These potential sub-sectors received detailed attention. ‘Competitiveness’ was examined on the basis of cost of production of selected items of the potential sub-sectors. Cost data was cited from ‘World Bank’ sources, although specifics are not provided. Islam (2004) also discussed the problems and constraints faced by these sub-sectors.

Ahmed et al (2004) examined the impact of ‘decent work variables’ on productivity of labour and suggested a positive relationship between the two. The analysis was based on data from enterprise level surveys, although the study did not carry out a disaggregation into sub-sectors. Further analysis of the score of ‘decent work’ and labour intensity in various sub-sectors would have provided useful insights for policy purposes, and could have included variables representing sub-sectors of manufacturing. Separate modeling analysis for a few major sub-sectors could also have produced insightful results, although this too was missing from their study.

Joshi (2005) examined the competitiveness of various manufacturing sub-sectors and agriculture as a whole. His paper discusses the export growth of sub-sectors, examines productivity and cost of production. The paper shows that labour productivity growth has been low and declining in manufacturing during 1992 to 1996, after which there has been a recovery.

The paper reviews the cost of production in RMG, frozen food and leather (based on data from other studies). It has been observed that in the Bangladesh leather industry, unit labour cost as well as productivity per worker is lower than in neighbouring countries. In RMG, wages are lower in Bangladesh, but labour productivity is also low. For the frozen food sector, the study expressed concern about social cost in terms of salinity of agricultural land. Although the study did not examine the link between decent work and productivity it emphasized that ‘skilled workers should have the opportunity to work in the condition of dignity protection and rights.’

Chapter 4

Criteria Used and Steps Followed in the Selection of Sub-sectors

4.1 Preliminary Selection of Seven Sub-sectors of Manufacturing²

Firstly, sub-sectors were ranked in terms of their value added, and share of value added, in the most recent year (2001-02) for which Census of Manufacturing Industry (CMI) data is available.

From this listing, three groups were identified:

- a) The first few sub-sectors constituting about 80 per cent of total value added at factor cost in manufacturing;
- b) The next sub-sectors in value added rank, contributing altogether 15 percent of value added at factor cost; and
- c) The next few contributing altogether 5 per cent of value added.

From (a), (b) and (c) respectively, it was decided that four, two and one sub-sectors would be selected. The number of sub-sectors to be chosen from group (a), (b) and (c) were not in proportion to the per cent contribution to value added. Whilst the final number chosen from each sub-group was also influenced by pragmatic considerations including coverage by other donor funded projects, the following criteria were applied to those sectors that experienced positive value added growth between 1996 and 2002 and growth between 1996 and 2002:

- a) The sector has a high share of total manufacturing employment;
- b) Value added per worker has risen during this period (1996 to 2002) compared to a previous period (1990 to 1996).
- c) Export growth has been positive;
- d) Growth of 'value of asset' is positive, as an indicator of investment; and that
- e) The sector has high potential for women's employment so that skill development for women can be targeted in the future.

4.2 Final Selection of Three Sub-sectors

In the final selection, a number of indicators were examined for the sub-sectors chosen in the first round.

- ▲ Production function estimates were used to examine any shift in technology between 1996 to 1998 and between 1998 to 2002 compared to base year of 1991.

² The choice of sub-sectors for the enterprise survey included seven sub-sectors from manufacturing and ICT as an example of a service industry. This selection was predetermined in the TOR for the study.

- ▲ Factor productivities from the production function estimates were compared; and
- ▲ Flow of FDI, export growth was examined.

In the enterprise survey in these sub-sectors, on the basis of opinion of the entrepreneur, the reasons behind variation of productivity among the sub sectors and within the sub sector was examined. In addition to the sub-sector level productivity analysis, the enterprise survey also collected and analyzed information to obtain cost per unit of a single output as a means of gaining some picture of competitiveness of individual enterprises and the sector more broadly.

The enterprise survey also obtained data on skill composition and future skill demand along with export growth and employment growth potential. Existence of enterprises with demonstrated good performance is also an indicator of such potential. Such information may also be obtained from newspaper reports, FDI data etc.

On the basis of the above information and further analysis, final selection of sub-sectors for skill development was made. Before the final choice, discussions with ILO staff and representatives from each of the eight sub-sectors were held to consider the suitability of the final selection for ongoing project activities.

4.3 Choice of Periods for Analysis

The first few Chapters of the analysis consist of an assessment of the performance of sub-sectors (at three digit level). Many of the variables have been compared between two periods. Given the CMI data points, the latest sub-period is 2001-02, as after this year, no CMI is available.

Since there have been significant policy changes between early 1990s and the second half of 1990s, the two sub-periods for comparison have been identified as 1991 to 1996 and 1996 to 2002.³

Although the CMI provides a comprehensive data series on all relevant aspects of each sub-sector, the last point in the data series is somewhat dated (2002). Therefore, more recent data (for period 2002 to 2005) on some of the variables (for example value of production, export-growth etc.) obtained from other sources (mentioned in annotation of 'outline' of Chapter 2.2) were used to check whether any sub-sector has gone through a drastic decline. Such trends were discussed with relevant business chambers etc to determine the reasons behind the change, with sub-sectors showing such fluctuations not being selected.

³ Rahman et al (2007) for example, also used these sub-periods to analyze the impact of trade liberalization.

Chapter 5

Changes in the Structure of the Manufacturing Industry

In the context of a developing country like Bangladesh, it is natural for the manufacturing sector to undergo some degree of structural change because different sub-sectors may grow at different rates, thus changing their relative weight in total output as well as employment. The present chapter undertakes an analysis of such changes with a view to identifying the sectors that are currently more important in terms of their share in total manufacturing output as well as growth of output and employment. The analysis starts by looking at the ranking of sub-sectors in terms of value added and then goes on to examine their output and employment growth.

5.1. Ranking of Sub-sectors by Real Value Added

Manufacturing sub-sectors at three digit level have been ranked on the basis of real gross value added (RGVA) in three years: 2002, 1996 and 1991. Table 5.1.1 presents the data.

Table- 5.1.1: Rank of Sub-sectors on the Basis of Gross Value Added 2002, 1996 and 1991

Title	Share of GVA in 2002	Rank 2002	Rank 96	Rank 91
Wearing apparel except	22.02	1	1	4
Drugs & pharmaceutical	17.94	2	6	6
Mfg. of textile	16.14	3	3	1
Food manufacturing	9.64	4	4	2
Tobacco manufacturing	5.35	5	2	3
Other chemical production	4.37	6	9	8
Pottery & China-wear	3.05	7	22	20
Furniture & fixtures	2.85	8	21	26
Ginning & processing	2.14	9	27	19
Printing & publishing	2.01	10	11	16
Non-metallic mineral	1.99	11	12	15
Leather footwear	1.96	12	5	14
Transport equipment	1.80	13	19	7
Electrical machinery	1.61	14	10	9
Industrial chemicals	1.49	15	7	5
Iron & steel basic industry	1.08	16	8	10
Leather & leather products	1.01	17	16	12
Beverage industries	.56	18	15	24
Paper & paper products	.51	19	13	11
Fabricated metal products	.47	20	14	13
Plastic products	.40	21	25	21
Other manufacturing industries	.34	22	18	27
Glass & glass products	.31	23	23	22
Embroidery of textile	.28	24	32	32
Rubber products	.17	25	26	25
Non-electrical machinery	.13	26	20	23
Wood & cork products	.12	27	24	18
Animal feed	.12	28	31	30
Misc. products of petroleum	.10	29	28	28
Decorative handicraft	.04	30	33	33
Photographic & optic	.01	31	29	30
Measuring instrument	.00	32	30	30
Petroleum refining	.00	33	17	17
Sports & athletic	.00	34	-	-

Source: Calculated from CMI data.

On the basis of ranking in terms of the share of RGVA, it is observed that top eight sub-sectors contributed about 81 per cent of RGVA in year 2002. These are wearing apparel, drugs and pharmaceuticals, textile manufacturing, food manufacturing, tobacco, other chemicals, pottery & china ware and furniture & fixtures.

The next group of sub-sectors contributing a total of about 15 per cent of RGVA consists of ginning & processing, printing & publishing, non-metallic mineral product, leather and footwear, transport equipment, electrical machinery, industrial chemicals, iron & steel basic industry, and leather & leather product. Remaining 17 sub-sectors contribute 5 per cent of RGVA.

Ranks of sub-sectors have changed over the years. While the ranks of some sectors have remained more or less unchanged, some have gone through drastic changes. The following features emerge from the data.

- ▲ Wearing apparel has risen from its 4th position in 1991 to the top position in 1996 and has maintained it till the recent period.
- ▲ Other sectors showing drastic rise in importance are:
 - drugs & pharmaceuticals (from sixth in 1996 to second),
 - pottery & china ware (from 22nd to 7th)
 - furniture & fixtures (from 21st to 8th).
- ▲ Textile manufacturing moved from first to third position
- ▲ Tobacco experienced a significant fall in ranking
- ▲ Within the next group (contributing 15 per cent of GVA)
 - printing & publishing has gradually improved its rank (from 16th in 1991 to 10th in 2002)
 - leather has gone down compared to 1996, but has improved in comparison to 1991
- ▲ Within the third group, paper & paper product has gone through a decline in rank.

There is a high concentration of GVA in a few sub-sectors. The first four sub-sectors contributed respectively 65.7, 64.2 and 60.1 per cent of total GVA in 2002, 1996 and 1991. Thus, concentration in a few sub-sectors has increased over the years.

5.2 Growth of Sub-sectors

The competitiveness and growth potential of various sub-sectors can be judged on the basis of the recent experience regarding growth ie: whether growth has been accelerating. Relevant data is presented in Table 5.2.1.

Table-5.2.1: Growth of GVA of Top Twenty-one Sub-Sectors

Sub-sector (top eight)	Acceleration of growth of GVA between two periods?		Growth rate during 1996-02	Change in QIP 2002 - 2005
	Yes	NO		
Wearing apparel		✓	3.53	171.1
Textile	✓		8.61	37.4
Food manufacturing	✓		8.52	-1.5
Drugs & pharma	✓		31.88	145.2
Tobacco		✓	-15.30	136.4
Pottery & China	✓		52.15	58.1
Furniture & fixture	✓		50.12	48.0
Other Chemical		✓	10.44	58.0
Second group (rank 9-17)				
Ginning & processing	✓		87.7	n.a.
Printing & publishing		✓	1.2	141.1
Non-metalic mineral		✓	4.7	-222.7
Leather footwear		✓	-14.8	113.2
Transport equipment	✓		36.5	8.1
Electrical machinery		✓	-4.5	29.3
Industrial chemicals		✓	-8.4	14.6
Iron & steel basic industry		✓	-12.5	39.2
Leather & leather products	✓		13.4	-8.7
Third group (rank 18 to 21)				
Beverage industries	✓		2.85	5.48
Paper & paper products		✓	-13.25	-16.89
Fabricated metal products		✓	-11.21	99.19
Plastic products		✓	22.17	82.88

Source: Source: Calculated from CMI data.

Table-5.2.2: Cross Tabulation of Share of Value Added and Growth of Value Added

Weight (percentage share of real gross value added in 2002)	Growth of value added during 1996-2002 (per cent per year)				
> 40.01		15.01-40.0	8.01-15	.01-8.0	Negative
> 9.01		Drugs & pharma	Textile Food mfg	Wearing apparel	
2.8-9.00	Pottery & china Furniture & fixture		Other chemical		Tobacco
1.01-2.8	Ginning & process	Transport equipment	Leather product	Printing & publ. Non-met-mineral	Leather footwear Electrical mach. Iron & steel
.01-1.01	Embroidery of textile good Animal feed Petroleum & coal prod. Dec. handicraft	Plastic	Photographic good	Beverage Other mfg. Glass prod. Rubber prod.	Paper & prod. Fabricated metal Non-elect-mech. Measuring instr.

Source: Calculated from CMI data.

In the first group (with rank 1 to 8) most sub-sectors show significant growth of GVA during the entire period of 1991 to 1996. In addition, most sectors have also achieved significant growth of QIP during 2002-2005 (for this period the CMI series of GVA is not available).⁴

One exception to the above is 'tobacco manufacturing', which experienced slowdown of growth during entire period, Food manufacturing accelerated during the two periods of 1990's but the change of QIP during 2002-2005 was negative. Further investigation into four digit sub-sector level shows that QIP has declined only in 'Sugar' production (this situation has occurred in 'sugar' in earlier periods as well, due to reduction of production in state owned mills). Growth rates in drugs & pharmaceuticals, pottery & china ware, and furniture have been very high.

Table 5.1.2, Figure 5.1 and Figure 5.2 show that most of the sub-sectors in group 2 have gone through deceleration and fluctuations of various extent. Only the 'transport equipment' production, 'ginning and processing' and leather & leather product have shown acceleration of GVA. 'Printing & publishing' decelerated between 1991-96 and 1996-2002. This sub-sector showed large increase in QIP in the recent sub-period and have positive growth in all three sub-periods, although acceleration of growth between 1991-96 and 96-02 did not take place. Leather has shown acceleration of GVA growth between these two periods, but has shown decline of QIP in the recent period.

⁴ Table A5.3 gives similar data for smaller sub-sectors (rank 22 to 33).

Figure 5.1A Growth of Major Sub-sectors: the First Group (Rank of GVA 1 to 8)

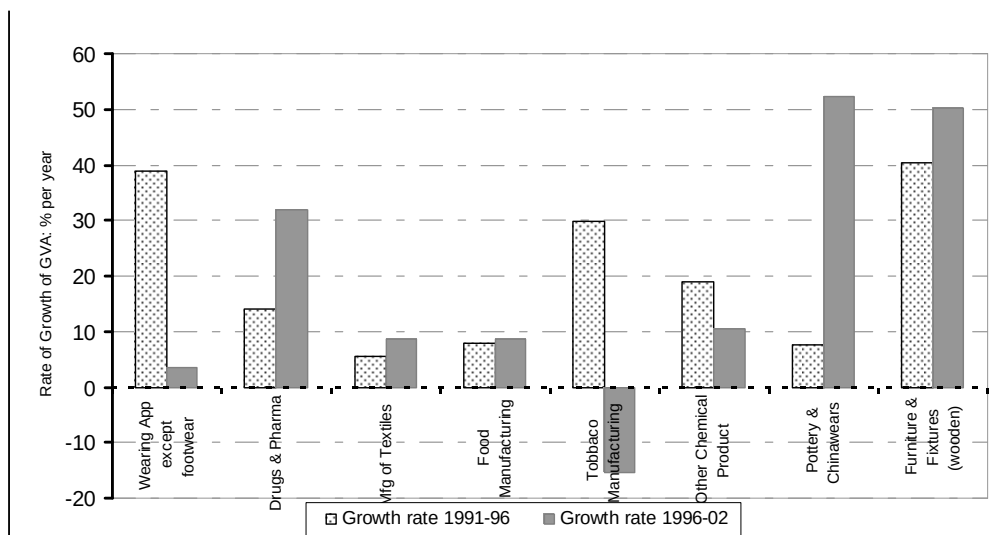


Figure 5.1B Growth of GVA Major Sub-sectors: the Second Group (Rank of GVA 9 to 17)

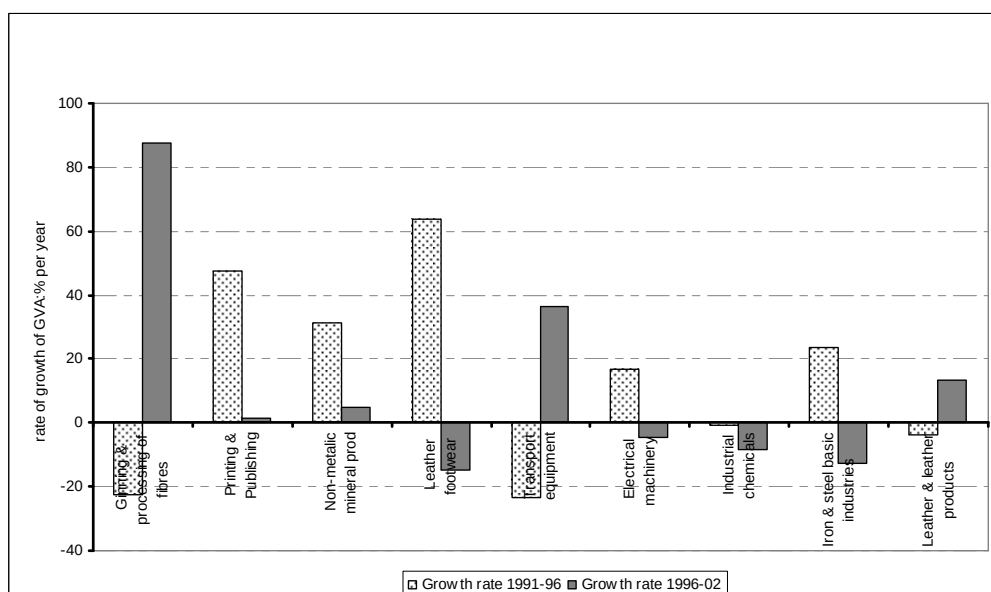


Figure 5.2A Share of Groups of Sub-sectors in Total Value Addition

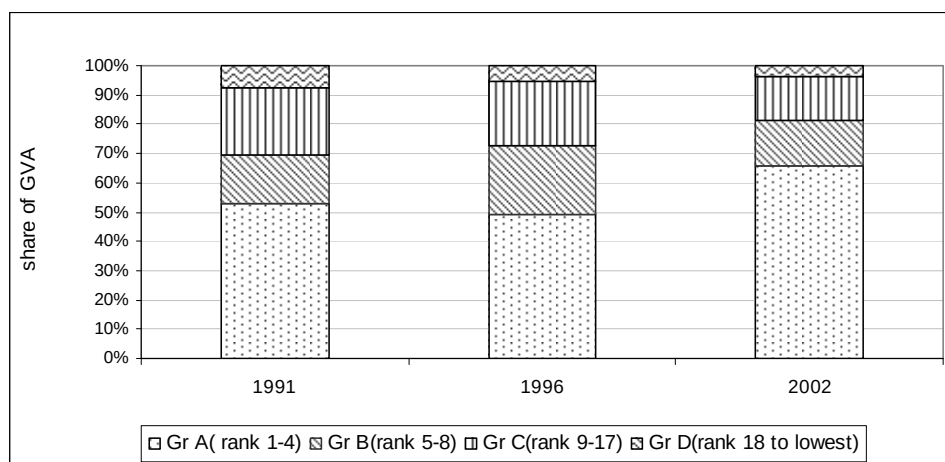
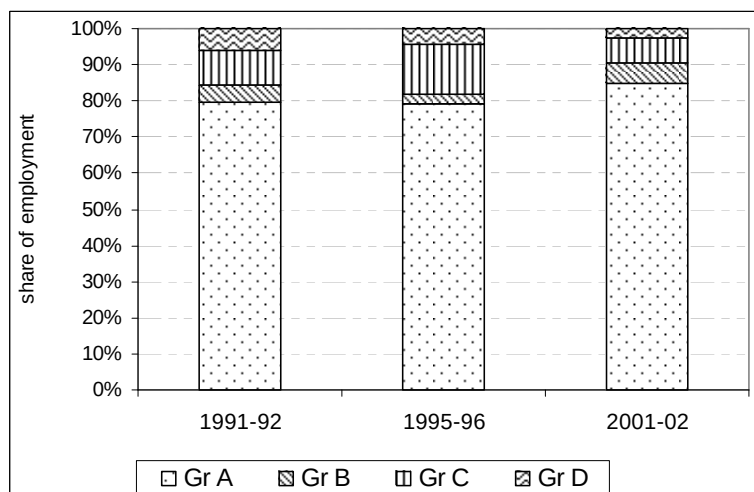


Figure 5.2B Share of Groups of Sub-sectors in Employment in Various Industries



These four sub-sectors can therefore be selected for further probing in terms of employment and export growth.

Among the sectors with small contribution to GVA (Table 5.2.1 & A5.2.1), plastic has experienced a sustained growth. A number of sub-sectors with tiny contribution to value added, viz., animal feed, decorative handicraft, photographic goods, have shown acceleration in growth during the second half of 1990s. But this is due to the low base with which growth is being computed. With such small share of GVA, the current focus of promoting growth through skill supply cannot be meaningful for these sub-sectors. A summary of recommended sectors based on growth?

5.3 Employment Growth

Next we examine the performance of employment growth in the sub-sectors with varying contribution to value added in manufacturing. Table 5.3.1 presents the relevant data. Positive employment growth during the entire period of 1991 to 2002 (i.e. in both sub-periods: 1991-96, 96-2002) was experienced by wearing apparel, drugs & pharmaceuticals, and food manufacturing. Amongst the high weight sub-sectors growth was experienced by pottery & chinaware and printing & publishing. Among the medium weight sectors there was leather, and among the small weight sub-sectors, plastic products and beverage products. The actual data on employment growth in each period for all sectors contributing more than 0.4% of GVA has been shown in appendix table A5.2. In terms of employment growth during 1996 – 2002, pottery and china ware, furniture & fixtures, and drugs & pharmaceuticals rank high.

The results of employment growth and GVA growth are similar and can therefore be easily combined to select better performing sub-sectors. Same sub-sectors have performed well in terms of both indicators (Table 5.3.1).

Table-5.3.1: Employment Growth Pattern in Major Sub-sectors with Varying Weights

Share (%) of value added (weight)	Positive employment growth in	
	Both 1991-96 and 1996-2002	Only in 1996-02
9.1 & above	Wearing apparel Drugs & pharma Food manuf.	
2.01 – 9.1	Pottery and China Other chemical Furniture & fixture Printing & Publ.	
1.01 – 2.01	Leather & leather prod.	Iron & steel Footwear Transport Electrical Non metallic mineral Industrial chemical
0.4 – 1.01	Plastic prod.	Fabricated metal

	Beverage	
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Source: Calculated from CMI data.

Table-A5.1: Growth Rate of GVA: 1991-2002 (24 July, 2008)

Title	GVAG 9102
Wearing apparel except	18.31
Drugs & pharmaceutical	23.43
Mfg. of textile	7.21
Food manufacturing	8.23
Tobacco manufacturing	2.79
Other chemical production	14.21
Pottery & China-wear	30.00
Furniture & fixtures	45.62
Ginning & processing	25.68
Printing & publishing	20.09
Non-metallic mineral	16.05
Leather footwear	14.64
Transport equipment	5.08
Electrical machinery	4.62
Industrial chemicals	-4.91
Iron & steel basic industry	2.32
Leather & leather products	5.28
Beverage industries	19.34
Paper & paper products	-3.22
Fabricated metal products	-1.05
Plastic products	10.42
Other manufacturing industries	22.09
Glass & glass products	9.28
Embroidery of textile	57.41
Rubber products	8.91
Non-electrical machinery	1.31
Wood & cork products	-4.19
Animal feed	38.06
Misc. products of petroleum	23.97
Decorative handicraft	40.51
Photographic & optic	6.62
Measuring instrument	-10.27
Petroleum refining	-100.00
Sports & athletic	-100.00

Source: Calculated from CMI data.

Table- A5.2: Employment Growth in Sub-sectors with Varying Weights

Weight Group	Sub-sector	Share of GVA in 2002	Employment growth		
			1996-02	1991-96	1991-2002
1.	Wearing apparel exce	22.02	11.21	28.01	18.56
1	Drugs & pharmaceutical	17.94	27.73	6.76	17.73
1	Mfg. of textile	16.14	-0.52	-2.07	-1.22
1	Food manufacturing	9.64	3.32	3.40	3.35
1	Tobacco manufacturing	5.35	-4.84	-13.37	-8.82
1	Other chemical production	4.37	2.75	0.77	1.84
1	Pottery & China-wear	3.05	54.91	8.25	31.62
1	Furniture & fixtures	2.85	33.05	11.16	22.61
2.	Ginning & processing	2.14	-9.69	-11.72	-10.62
2	Printing & publishing	2.01	18.75	21.24	19.87
2	Non-metallic mineral	1.99	-27.70	17.23	-9.94
2	Leather footwear	1.96	-26.41	73.85	8.77
2	Transport equipment	1.80	-12.28	19.07	.79
2	Electrical machinery	1.61	-13.55	15.22	-1.49
2	Industrial chemicals	1.49	2.57	-3.80	-.37
2	Iron & steel basic industry	1.08	-6.62	2.20	-2.71
2	Leather & leather products	1.01	7.01	3.35	5.33
3.	Beverage industries	.56	8.53	30.05	17.83
3	Paper & paper products	.51	-0.66	-8.17	-4.14
3	Fabricated metal products	.47	-5.70	+3.35	-1.69
3	Plastic products	.40	8.70	7.09	7.96

Source: Calculated from CMI data.

Table-A5.3: Growth of GVA of Smallest Sub-sector (21st to 33) Sub-sectors

Sub-sector	Acc of GVAGr		Growth rate (1996-02)	Changes in QIP
Other manufacturing industries	✓		2.02	-
Glass & glass products		✓	7.91	27.90
Embroidery of textile	✓		135.28	-
Rubber products	✓		6.82	3.63
Non-electrical machinery		✓	-10.98	26.88
Wood & cork products		✓	-7.82	-9.13
Animal feed		✓	95.64	-
Misc. products of petroleum	✓		41.52	-
Decorative handicraft	✓		78.57	-
Photographic & optic	✓		12.65	-
Measuring instrument	✓		-16.04	-10.03
Petroleum refining		✓	-	-
Sports & athletic		✓	-	-

Source: Calculated from CMI data.

Chapter 6

Competitiveness and Export Potential

Assessment of competitiveness of an economy should be done to examine the changes of performance of a sub-sector over time and also for the purpose of comparison among sub-sectors. Competitiveness reflects the productivity of the resources used. It will reflect the efficiency of utilization of labour, capital and land and other natural resources (WCR 2003).

It is however, difficult to arrive at direct measures of competitiveness and in this study we use a number of indicators to examine competitiveness. Export growth is one of the chosen indicators. Sectors may also produce mainly for domestic market because of a variety of reasons: there may be restrictions and various types of compliance requirements for export, there may be difficulty in establishing contacts by the producers etc. In these cases production for domestic market can be considered as competitive, if resources are used efficiently. Moreover, efficiency is reflected in sustained growth in the use of abundant factor input and its contribution to value addition. Therefore, the present study will examine the factor intensity of production in the sub-sectors and the growth of productivity of each input.

6.1 Labour Intensity and Employment Growth

Employment growth being a desirable outcome of industrial growth in labour abundant countries, the labour intensity of growth oriented industries is a subject of utmost interest. Theories of industrialization and trade specialization have emphasized the relationship between factor abundance and factor intensity of industrialization.

Theories of development with surplus labour have viewed the presence of surplus labour in the traditional sector as a source of elastic labour supply at low wage. This helps generate a reinvestible surplus in the hands of entrepreneurs. Growth of labour-intensive industries helps absorb surplus labour as long as supply is available. (reference?)

Traditional Heckscher-Ohlin type theories (reference?) have used open economy model and established that a labour-abundant country should specialize in labour-intensive export industries and the vice-versa. Even if the well established theoretical underpinnings are accepted, there can be good rationale for Bangladesh to try to move beyond morrow specialization in a small number of sub-sectors with lowest labour intensity to sub-sectors with medium labour intensity. The following are major issues in this context:

- ▲ A narrow range of specialization in the export market can be dangerous because of volatility of both global demand and supply situation. A practical example in this context is RMG in Bangladesh. This is the single dominant source of export earnings for the country. However, conditionalities and compliance requirements imposed by the buyers often lead to volatility in demand for Bangladeshi items. In addition, expansion of such sectors in other developing countries implies rising competition. Therefore, it would be sensible on the part of policy makers to aim at diversification.
- ▲ While labour-intensive industries can lead to faster employment growth, some of the sub-sectors in the range of medium labour intensity can also lead to high rate of employment growth.

- ▲ In fact, the experience of Bangladesh's manufacturing sector growth has shown that sub-sectors with medium-low labour intensity have achieved fast rate of growth. This has been possible because market access and scope of entrepreneurial initiative are created through a variety of channels. Contacts often imply access to investment opportunity in a particular sub-sector, which may not be one of lowest labour intensity. Such investment is most often immobile across sub-sectors. Therefore a combination of sub-sectors with varying labour (or capital) intensity may be more desirable.
- ▲ Sub-sectors with very high labour intensity usually exhibit low value addition per person. This will imply slow growth of real wage and low standard of living of the workers. 'Decent work' involves higher growth of real wage and therefore moving beyond the highest labour intensity regime to medium labour intensity.
- ▲ A related question is, which range of 'capital-labour ratio' should be considered as 'labour-intensive'.
- ▲ For specific commodities, there is usually a state of the art technology available and the choice may be limited in terms of available technologies.
- ▲ In recent years, Bangladesh has achieved an expansion of education. Both primary and secondary school enrolment has risen significantly. While education is itself a development goal, it can also lead to shift in labour productivity if suitable employment is generated. This can be possible through provision of appropriate training (the trainability is enhanced through secondary education) and access to technology in sub-sectors with medium/medium-low labour intensity.

Keeping the above points in mind, we have examined the labour intensity of manufacturing sub-sectors and its implications for employment and productivity. This has provided the rationale behind selection of sub-sectors for support through training and other project based activities focused on skills development.

Table 6.1 presents data on employment growth in sub-sectors with varying capital-labour ratio. Four groups of capital-labour ratio have been used. Two (RMG and Furniture & fixture) of the first group of sectors (the highest ranking eight sectors, contributing 80% of GVA) fall in low K/L group and generate high rate of growth of employment (above 10% per annum). These were also identified to have positive growth of GVA. Thus, these sub-sectors, beyond doubt, will be at the centre point for creating employment generating growth.

Table-6.1.1: Employment Growth in Sub-sectors with Varying Capital Intensity

Fixed asset per person engaged (taka/person)	Employment growth rate (per cent per year) during 1996 - 2002				
	- to 0	.01 – 5.0	5.01 – 10.0	10.01 – 20.0	20.01 +
< 50,000	Iron & steel basic industries Non-metallic mineral products Gining Leather footwear Transport equipment Electrical machinery Paper & paper products	Photographic & optical goods Measuring instruments	Leather Plastic products Other mfg. Industries	RMG	Furniture

	Fabricated metal products Glass & glass products Rubber products Non-electrical machinery Drugs & pharmaceuticals				
50,000 – 200,000	Tobacco	Food mfg., Other chem.	-	Printing & publishing	Pottery & china
200,000 – 400,000	Textile	-	-	-	Drug & Pharma
400,000 +	-	Industry chem.	-	-	Decorative handicrafts Animal feed Misc. products of petroleum & coal

. Source: Calculated from CMI data.

The next range of K/L (taka 50,000 to 200,000 per person) may also be considered as low capital intensity. Three major sectors with positive GVA growth are in this K/L group and are observed to have positive employment growth. Growth rate of employment in printing & publishing and pottery & china-ware are in the 'high' range (19% and 56% respectively), and in food manufacturing and other chemical it is positive, though not very high.

Drugs & pharmaceuticals comes in the next higher K/L group, but has experienced high rate of employment growth (27.7 per cent per annum). This sub-sector illustrates that a combination of high-medium capital intensity and very high rate of growth of employment is a feasible option. Within this K/L group, textile is the other major sub-sector, but has experienced a negative growth of employment.

6.2 Factor Productivity

The present report uses two types of indicators of productivity: partial factor productivity and total factor productivity. Partial factor productivity can be examined through the following indicators:

growth of productivity of factor 'r' during period n, n-i

$$= \frac{\text{increment in (real) value added between period } n-i \text{ \& } n}{\text{increment in factor quantity of 'r' between period } n-i \text{ \& } n}$$

Table 6.1.1 and 6.1.2 show partial productivity of labour and fixed asset respectively.⁵ Those with positive factor productivity of both factors, especially during the recent years and those experiencing a rise in such productivity will be considered as the better performing sectors.

⁵ The table has been presented for first 21 sub-sectors, with 0.4% or higher contribution to GVA. For sub-sectors with very small number of establishments or very small GVA, calculation of FP may not be meaningful and some of these did not exist in earlier sub-periods.

The following sub-sectors show positive factor productivity for both labour and fixed assets during 1997-2000 and 2000 to 2002 periods:

- Wearing apparel
- Drugs & pharmaceuticals
- Food manufacturing
- Other chemical
- Furniture
- Footwear
- Iron & steel
- Leather
- Beverage
- Metal production

In addition, the following sub-sectors have shown positive productivity of both inputs only during the latest sub-period.

- Pottery and chinaware
- Electrical machinery
- Industrial chemical
- Plastic product

During this period, 'transport' manufacturing and non-metallic mineral shows positive partial productivity of labour, while paper & paper product, has non-negative partial productivity of labour (0/3%).

Thus, the sub-sectors which show better performance in growth of employment, value added and labour intensity, also demonstrate better productivity performance.

Table-6.2.1: Ratio of Change in GVA & Change in Employment

Sub-sectors	AB 91-94	AB 94-97	AB 97-00	AB 00-02
Wearing apparel except	12.03	3.59	5.91	1.10
Drugs & pharmaceutical	19.42	-3.69	2.03	46.03
Mfg. of textile	-13.15	-5.48	-2.20	-10.58
Food manufacturing	-342.70	-29.86	31.40	44.34
Tobacco manufacturing	260.97	-41.69	664.34	492.92
Other chemical production	13.39	99.02	49.58	222.02
Pottery & China-wear	-1.16	-2.04	-3.32	10.10
Furniture & fixtures	11.67	11.86	56.64	27.92
Ginning & processing	-18.85	-77.17	2.12	-154.06
Printing & publishing	16.66	25.53	14.42	-7.61
Non-metallic mineral	-495.97	-4.43	4.42	2.51
Leather footwear	1.45	-374.92	11.62	20.51
Transport equipment	34.11	117.92	-11.23	213.05
Electrical machinery	22.31	42.53	-295.60	57.13

Industrial chemicals	-74.08	-65.83	-84.55	83.75
Iron & steel basic industry	-199.60	-93.72	98.69	85.00
Leather & leather products	-325.77	-12.02	7.79	20.68
Beverage industries	45.84	43.31	3.57	3.67
Paper & paper products	11.15	22.28	-30.69	-.41
Fabricated metal products	-.40	19.15	67.34	43.13
Plastic products	-112.06	-19.94	-5.93	9.43

Source: Calculated from CMI data.

Table-6.2.2: Ratio of Change in GVA & Change in Fixed Asset

Sub-sectors	AC 91-94	AC 94-97	AC 97-00	AC 00-02
Wearing apparel except	668.05	181.75	869.08	30.76
Drugs & pharmaceutical	103.22	-208.60	33.48	199.92
Mfg. of textile	48.55	-21.91	-19.02	54.74
Food manufacturing	481.82	-316.71	52.15	145.46
Tobacco manufacturing	745.09	1806.35	-3213.60	581.24
Other chemical production	23.10	199.63	408.77	1571.37
Pottery & China-wear	-7.90	-15.05	-12.30	68.49
Furniture & fixtures	-926.84	166.35	4088.59	6406.07
Ginning & processing	-140.53	-74.06	-5.55	-4583.20
Printing & publishing	767.47	220.53	344.68	247.65
Non-metallic mineral	295.24	-55.10	125.31	-194.33
Leather footwear	41.66	234.45	36.55	125.39
Transport equipment	41.20	52.96	-40.74	-133.11
Electrical machinery	-102.92	55.27	11814.80	208.21
Industrial chemicals	-14.93	-7.12	29.93	19.60
Iron & steel basic industry	248.39	134.39	106.68	142.99
Leather & leather products	25.08	-55.72	23.18	33.94
Beverage industries	166.57	343.49	63.63	123.57
Paper & paper products	36.54	91.80	808.78	-1.70
Fabricated metal products	-3.79	135.50	217.62	137.34
Plastic products	-412.96	-59.36	-325.89	101.43

Source: Calculated from CMI data.

6.3 Export Performance

As mentioned above, exports can reflect a sub-sector's competitiveness. Data on exports and growth of exports of various manufactured goods are presented in Tables 6.3.1, 6.3.2 and 6.3.3. While export is neither a necessary nor a sufficient condition for a sub-sector's competitiveness, when a sub-sector continues to achieve sustained export growth, its importance as a contributor of foreign exchange must be taken into account by policy makers.

Before moving on to the sub-sector level analysis, it is worth highlighting that at present manufacturing export contributes more than 85 per cent of total export. Contribution of primary exports declined over 1991 to 2006 (from 9.2 per cent to 8.8 per cent).

Export earning is, however, concentrated in a few sub-sectors. Tables 6.3.1 and 6.3.2 show that about 80 per cent of manufacturing export is from the 'wearing apparel (RMG)' sector. Leather and textiles are the only other significant contributors to exports. Bicycle, ceramics and pharmaceuticals also deserve mention, especially as emerging sectors in the export field. However, data presented in Table 6.3.2 show that items other than RMG account for a very small share in total exports. Traditional items like jute goods and carpets contribute about 2 per cent only.

Table-6.3.1: Export Growth of Some Major Sectors 1991-2000 and 2000-06

Commodities	Growth (%) 1991-96	Growth (%) 1996-00	Growth (%) 2000-06
Primary commodities	9.22	-035	8.85
Raw jute	-2.78	-5.74	13.17
Tea	-5.17	-14.52	-6.53
Frozen food	17.21	2.32	5.04
Other primary	40.89	-22.42	49.73
Manufactured goods	19.27	11.59	10.99
Jute goods (all sorts)	2.52	-5.18	5.34
Leather (crust/finished)	9.53	-2.03	4.82
Woven garment	-	12.45	4.90
Knitwear	-	20.70	20.57
Chemical products	17.02	-1.27	14.33
Other manufactured goods	78.64	14.57	13.55
Total exports	17.72	10.33	10.82

Source: EPB Reports various years.

Given the high concentration of export, one would be interested in growth of exports in the smaller sub-sectors for a reflection of future prospects. Table 6.3.3 shows growth of export earnings of the major manufactured items. Many of the 'wearing apparel' items continue the fast growth and the potential of the sub-sector's export role continues.⁶ Among the sub-sectors with sizeable export earnings, pharmaceuticals and home textile show high growth in both sub-periods 1996 to 2002 and 2002 to 2006. Leather export shows rise of growth in the latest sub-period over the previous period and is third in terms of share of value added.

Table 6.3.2 shows that computer services form 0.2 per cent of total export earnings. This item is growing fast.

In addition to the items listed in the tables, new items are entering the list of exports. Shipbuilding is one such sub-sector which exported during 2007-08. The success continues with more orders for the coming years. In fact, the European countries form the main market of this export, and demand is likely to expand rapidly. The representative of the 'Shipbuilder Association' reported this at the pre-project meeting for the present study.⁷ A number of newspapers also published reports on this innovative export. A report in 'The Daily Star' (August 11, 2008) mentioned that this export item has good prospect and the basis is the Danish ambassador's discussion with Bangladesh's foreign minister where he mentioned that Denmark may import more from Bangladesh and this country may emerge as a 'shipbuilding nation'.

Table-6.3.2: Export of various commodities in 2006-07

Commodities	2006-07 (Export in million taka)	Share in total Export Earning (%)
Woven Garments	321656.25	38.891
Knitwear	314471.86	38.022
Leather (crust/finished)	18375.62	2.222
Home textile	17746.38	2.146
Jute yarn & twine	13340.07	1.613
Others ⁸	163437.86	19.25

Source: Unpublished data obtained from EPB.

Table-6.3.3: Rate of Growth of Export of Manufactured Commodities of Various Sub-sectors

Sub-sector group	Commodities	Average growth rate over the period		
		2001-02 to 2005-06	1995-96 to 2001-02	1991-92 to 1995-96
Drug & pharma	Pharmaceuticals	48.55	19.09	45.46
Plastic product	PVC bags	25.18	172.57	-

⁶ Growth rates could not be calculated when value of export with same title of the commodity was not reported for any one year.

⁷ Held on May 24, 2008 at BIDS Conference Room.

⁸ The top 3 commodities within this group are Chemical fertilizer, terry towel, footwear leather.

	Synthetic ropes	38.07	-	-
	Acrylic yarn	0.35	-	-
Leather	Leather (crust/finished)	9.78	5.56	16.29
	Footwear (leather)	14.57	17.46	74.04
Jute textile	Jute yarn & twine	19.03	3.23	24.91
	Jute manufactures	18.26	-2.89	-0.17
	Others (jute products)	-100	11.58	21.19
Cotton textile	Terry towel	16.79	17.76	-
	Home textile	26.49	40.76	-
	Textile fabrics	-2.66	51.45	-
	Cotton yarn	38.23	-	-
Wearing apparel	T-shirt	39.78	13.38	-
	Sweater	23.91	48.66	-
	Others (knit)	30.96	23.35	-
	Shirts	9.17	7.31	-
	Trousers	41.26	42.16	-
	Jackets	2.55	22.94	-
	Others (woven)	-17.69	12.25	-
Non-electric machine	Engineering products	2.12	-29.48	29.42
	Iron chain	150.24	47.98	-
	Others (enrg. products.)	237.19	199.67	-86.68
	Tents	8.57	27.70	-
Pottery & ceramic	Ceramic tableware	15.68	14.07	-
	Golf shaft	-0.15	-4.13	-
Transport	Bicycle	26.14	-	-
Others	Furnace oil	126.35	-3.30	-19.65
	Chemical fertilizer	31.94	-5.64	31.86
	Footwear (sports)	57.03	-	-
	Camera parts	23.21	41.65	-

Source: Reports of EPB, Various years.

Table-A6.1: Growth of Gross Value Added Per Employee
(per cent per year)

Group	Title	1991-1996	1996-2002
1.	Wearing apparel except footwear	8.46	-6.90
1	Drugs & pharmaceuticals	6.78	3.25
1	Mfg. of textile	7.78	9.17
1	Food manufacturing	4.33	5.04
1	Tobacco manufacturing	49.77	-11.03
1	Other chemical products	18.00	7.49
1	Pottery & China-wear	-.57	-1.78
1	Furniture & fixtures (wooden)	26.30	12.83
2.	Ginning & processing of fibers	-12.02	107.82
2	Printing & publishing	21.62	-14.77
2	Non-metallic mineral products	12.02	44.80
2	Leather footwear	-5.90	15.83
2	Transport equipment	-35.54	55.62
2	Electrical machinery	1.30	10.46
2	Industrial chemicals	3.35	-10.69
2	Iron & steel basic industries	20.80	-6.30
2	Leather & leather products	-6.81	5.96
3.	Beverage industries	9.69	-5.23
3	Paper & paper products	20.19	-12.68
3	Fabricated metal products	9.02	-5.84
3	Plastic products	-8.68	12.39
3	Other manufacturing industries	36.51	-5.92
3	Glass & glass products	1.79	19.56
3	Embroidery of textile goods	533.49	-57.41
3	Rubber products	6.14	14.02
3	Non-electrical machinery	19.96	-.54
3	Wood & cork products	5.15	5.90
3	Animal feed	-.99	21.44
3	Misc. products of petroleum & coal	20.63	5.19
3	Decorative handicrafts	-	-6.81
3	Photographic & optical goods	4.52	9.06
3	Measuring instrument	6.45	-16.15

3	Petroleum refining	11.84	-
3	Sports & athletic	-	-

Source: Calculated from CMI data.

Table-A6.2: FDI Inflow in Bangladesh during 2005: Distribution by Sectors (in million US\$)

FDI Sectors	2004			2005			2005 Share (%)
	Jan-Jun	Jul-Dec	FDI-2004	Jan-Jun	Jul-Dec	FDI-2005	
a. Agriculture & Fishing	1.3	0.4	1.7	1.6	0.7	2.3	0.3
b. Power, Gas & Petroleum	38.7	85.3	124.0	113.1	95.2	208.3	24.6
b.1. Power	13.4	16.9	30.3	12.7	14.5	27.2	3.2
b.2. Gas & Petroleum	25.3	68.4	93.7	100.4	80.7	181.1	21.4
c. Manufacturing	41.7	97.7	139.4	137.9	81.5	219.4	26.0
c.1. Food Products	5.6	3.7	9.3	-	-	-	0.0
c.2. Textile & Wearing	14.7	23.0	37.7	52.0	44.5	96.5	11.4
c.3. Chemicals & Pharma	1.2	2.9	4.1	2.8	1.1	3.9	0.5
c.4. Metal & Machinery Prods.	0.7	-	0.7	-	0.1	0.1	0.0
c.5. Vehicle & Transport Equip	-	-	-	0.7	0.9	1.6	0.2
c.6. Fertilizer	11.9	4.4	16.3	46.7	14.5	61.2	7.2
c.7. Cement	2.2	57.1	59.3	29.6	15.7	45.3	5.4
c.8. Leather & Leather Prods.	-	0.4	0.4	0.7	-	0.7	0.1
c.9. Other Manufacturing	5.4	6.2	11.6	5.4	4.7	10.1	1.2
d. Trade & Commerce	24.7	41.9	66.6	59.9	70.6	130.5	15.4
e. Transport, Storage & Comm.	30.9	96.6	127.5	167.4	114.5	281.9	33.3
e.1. Telecommunication	30.9	96.6	127.5	165.3	113.5	278.8	33.0
e.2. Others (TSC)	-	-	-	2.1	1.0	3.1	0.4
f. Service	1.1	-	1.1	2.0	1.0	3.0	0.4
g. Others	-	-	-	-	-	-	0.0
Total	138.4	321.9	460.3	481.9	363.5	845.4	100

Source: Bangladesh Bank Enterprise Survey, 2006 Quoted in WWW.boi.gov.bd

Field Code Changed

Chapter 7

Factor Productivity and Technical Progress

In identifying sectors with growth potential it is also important to examine the contribution of the major factors of production. In a production function framework, this can be done by estimating partial factor productivities. However, in a dynamic economy, it is not only the quantity of inputs that is important; how efficiently an economy or its various sectors utilize the factors of production is also important. In other words, it would be important to examine whether growth in the various sectors is being achieved only through increases in the quantity of the factors or technical progress plays any role. The standard procedure for examining the role of technical progress is to estimate “total factor productivity” (TFP) by using a production function approach (see for examplereference) In the present chapter, an attempt is being made to examine both the partial factor productivities and TFP for the manufacturing industries of Bangladesh.

An attempt is also made to examine the relative contribution of the quantity of labour (or employment in quantitative terms) and its productivity. This would enable one to see the role of various sectors in generating *productive* employment as opposed to employment per se.

7.1. Analysis of Productivity: The Methodology Employed

The methodology adopted for estimating the partial and total factor productivity is derived from a Cobb-Douglas type production function (reference?). In logarithmic form, the production function may be written as

$$\ln Y = a + b \ln L + c \ln K + d T \quad (1)$$

Where Y, L, K, and T stand respectively for value added (output), labour, capital, and time. Since the equation is in double logarithmic form, the coefficients b and c would represent the elasticity of value added with respect to the respective factors of production. The coefficient of T (time trend) will capture TFP; and this coefficient multiplied by 100 will give the (exponential) growth of TFP in per cent terms. In conceptual terms, TFP growth represents the residual of value added growth that cannot be explained by the growth of the factors of production. In other words, TFP growth is given by the difference between value added growth and the weighted sum of the growth of the factors of production (labour and capital, in this case). In terms of the equation above, the estimated coefficient of T represents this residual.

In order to examine the relative contribution of employment in quantitative terms and labour productivity, a decomposition exercise has been undertaken where value added growth has been decomposed into the parts contributed by employment growth (in quantitative terms) and labour productivity growth. The methodology adopted for this purpose is simple, and starts from the following:

$$Y = L \times Y/L \quad (2)$$

For small changes, one can write the above as:

$$\Delta Y = \Delta L + \Delta Y/L \quad (3)$$

where Δ denotes growth rate.

In other words, growth in value added is the sum of the growth of employment and the growth of labour productivity.

7.2. Analysis of Productivity: Empirical Results

Equation 1 has been estimated for the manufacturing industries of Bangladesh at the three-digit level by using data available from the CMI for the years 1990-91 to 2001-02. Likewise, data on value added and employment from the same source has been used to carry out the decomposition exercise shown in equation (3) above. The results obtained from the above exercises are presented in Annex Tables A7.1, A7.2, and A7.3. A summary of the productivity analysis based on the regression exercise and the decomposition exercise is presented in Table 7.1. Before looking at the data and the summary in Table 7.1, it may be in order to say a few words on the quality of data. First, the quality of the CMI data has been questioned by users in the past (for example, Rahman, et al, 2007). This becomes a serious problem particularly because of the gap in coverage and variation in coverage from year to year. Second, for some sectors, data are not available for all the years mentioned above. As a result, the regression estimates are based on a smaller number of observations, which, in turn can have implications for the degrees of freedom of the estimates. In one case (viz., sports goods) the results are not reported because data were available only for four years).

Despite the shortcomings of the data mentioned above, the results obtained appear to be generally plausible, although questions can be raised in specific cases. First, the data appear to fit well into equation (1) if the estimates of R-squared and F are any guide. Second, the coefficients of capital are found to be statistically significant in a good number of cases. And in a larger number of cases, the coefficients of both labour and capital have the right signs, though not statistically significant. However, there are a number of cases where the coefficients are negative and statistically significant.

Looking at the summary of the productivity analysis presented in Table 7.1, a few conclusions could be drawn, albeit tentatively. First, out of the eight sub-sectors identified earlier (in Chapters 4 and 5) as the first group (accounting for 80% of value added, to be called Category A), both capital and labour appear to make positive contribution only in the case wearing apparel and drugs and pharmaceuticals. However, in a number of other cases, e.g., food manufacturing, tobacco manufacturing, other chemicals, pottery and chinaware, and furniture, either labour or capital make a positive contribution. Second, in category B (accounting for 15% of value added), printing and publishing and non-metallic minerals show positive contributions of both labour and capital.

TFP growth is positive in a good number of cases, indicating the presence of technical progress. In category A, these are: textiles, food manufacturing, other chemicals, pottery and chinaware, and furniture. Positive TFP growth is exhibited by a good number of industries in the other two categories as well.

Coming to growth decomposition, the last three columns of Table 7.1 indicates cases where the contribution of labour productivity was positive in either one or both sub-periods (viz., 1990-96 and 1996-2002). Again, most sub-sectors in group A demonstrate this to be the case. In category A, the contribution of labour productivity exceeded that of employment in both sub-periods in the cases of textiles, food manufacturing, and other chemical products. There are a good number of such cases in the next two groups as well.

Based on the various considerations mentioned above (viz., partial factor productivity, TFP growth indicating technical progress, growth of employment and labour productivity the sectors that stand out are.

Category A:

Wearing apparel, drugs and pharmaceuticals, food, other chemicals, pottery and chinaware, furniture;

Category B:

Printing, non-metallic minerals, leather & leather product, electrical machinery, iron and steel;

Category C:

Paper and paper products, metal products, plastic products, embroidery of textile goods, wood products, animal feed, and decorative handicrafts.

Table-7.1: A Summary of Productivity Analysis

Sectors	Rank	TFP growth positive	Labour productivity Positive	Capital productivity positive	Both Labour and capital productivity positive	Labour productivity growth exceeded employment growth during 1990-96	Labour productivity growth exceeded employment growth during 1996-2002	Labour productivity growth exceeded employment growth in both periods
Wearing apparel except footwear	1		✓	✓	✓			
Drugs & pharmaceuticals	2		✓	✓	✓	✓		
Mfg. of textile	3	✓				✓	✓	✓
Food manufacturing	4	✓		✓		✓	✓	✓
Tobacco manufacturing	5			✓		✓		

Other chemical products	6	✓		✓		✓	✓	✓
Pottery & China-wear	7	✓	✓					
Furniture & fixtures (wooden)	8	✓	✓			✓		
Ginning & processing of fibres	9					✓	✓	✓
Printing & publishing	10	✓	✓	✓	✓	✓		
Non-metallic mineral products	11	✓	✓	✓	✓		✓	
Leather footwear	12	✓		✓			✓	
Transport equipment	13	✓		✓			✓	
Electrical machinery	14	✓	✓	✓	✓		✓	
Industrial chemicals	15			✓		✓		
Iron & steel basic industries	16	✓		✓		✓	✓	✓
Leather & leather products	17		✓					
Beverage industries	18	✓	✓					
Paper & paper products	19	✓		✓		✓		
Sectors	Rank	TFP growth positive	Labour productivity Positive	Capital productivity positive	Both L & K positive	Exceeded during 1990-96	Exceeded during 1996-2002	Labour productivity growth exceeded employment growth in both periods
Fabricated metal products	20	✓		✓		✓		
Plastic products	21	✓	✓				✓	
Other Mfg. Industries	22			✓				
Glass & glass products	23			✓			✓	
Embroidery of textile goods	24	✓	✓	✓	✓			

Rubber products	25			✓			✓	
Non-electrical machinery	26	✓		✓		✓	✓	✓
Wood & cork products	27	✓	✓			✓	✓	✓
Animal feed	28	✓	✓	✓	✓	✓		
Misc. prod. of petroleum & coal	29	✓	✓			✓		
Decorative handicrafts	30		✓	✓	✓	✓		
Photographic & optical goods	31	✓	✓				✓	
Measuring instruments	32		✓					
Petroleum refining	33	✓				✓		

Source: Calculated from CMI data.

Table-A7.1: Regression Results

Sectors	Intercept	LnL	LnK	t (time)	F (number of observations)	Adjusted R ²
Wearing apparel except footwear	0.4931 (0.09)	0.3061 (0.48)	0.6221 (1.41)	-0.0061 (-0.08)	38.85 (12)	0.9117
Drugs & pharmaceuticals	-1.7009 (-1.69)	0.5312** (2.30)	0.6117** (2.29)	-0.0041 (-0.19)	109.08 (13)	0.9643
Mfg. of textile	27.5773*** (6.41)	-1.2812*** (-5.01)	-0.0945 (-0.63)	0.0613** (2.42)	23.99 (13)	0.8518
Food manufacturing	19.0133** (2.70)	-2.9412*** (-4.21)	2.5860*** (4.17)	0.0068 (0.23)	16.56 (13)	0.7955
Tobacco manufacturing	2.0926 (0.58)	-0.0102 (-0.03)	1.0378*** (5.38)	-0.0327 (-0.85)	14.57 (13)	0.7724
Other chemical products	6.5017 (1.21)	-0.1938 (-0.31)	0.4394*** (3.25)	0.0784*** (5.31)	38.52 (13)	0.9037
Pottery & China-wear	-0.3491 (-0.16)	1.0044 (1.53)	-0.3762 (-0.58)	0.0559 (0.94)	6.02 (13)	0.5565
Furniture & fixtures (wooden)	-5.7567 (-1.33)	1.3523* (2.05)	-0.0279 (-0.07)	0.0733 (0.79)	9.99 (13)	0.6922
Ginning & processing of fibres	19.9829 (8.06)	-1.3089*** (-4.48)	-0.6812*** (-5.69)	-0.0013 (-0.04)	19.97 (13)	0.8259
Printing & publishing	-4.3801 (-0.83)	0.3670 (0.71)	1.2036*** (3.90)	0.0092 (0.11)	40.22 (13)	0.9074
Non-metallic mineral products	1.5859 (0.70)	0.1697 (1.26)	0.5782 (1.81)	0.0268 (0.40)	14.29 (13)	0.7686
Leather footwear	0.3721 (0.32)	-0.2061 (-0.80)	1.2008*** (3.39)	0.0585 (1.34)	35.05 (13)	0.8949
Transport equipment	15.4171 (2.73)	-1.0073 (-1.34)	0.2571 (0.84)	0.0149 (0.32)	0.62 (13)	-0.1042
Electrical machinery	-5.2116 (-2.04)	1.2767*** (4.52)	0.0298 (0.27)	0.0878** (3.11)	22.16 (13)	0.841
Industrial chemicals	8.8333 (1.61)	-0.3943 (-0.63)	0.3419 (0.61)	-0.0188 (-0.87)	0.83 (13)	-0.0432
Iron & steel basic industries	-2.4025 (-0.39)	-0.6948 (-1.10)	1.9315*** (6.78)	0.1169*** (5.22)	17.25 (13)	0.8024
Leather & leather products	-11.8489 (-2.38)	2.1696** (2.83)	-0.0946 (-0.24)	-0.057** (-2.50)	6.89 (13)	0.5957
Beverage industries	4.8154 (6.01)	0.6774*** (5.76)	-0.7473*** (-3.34)	0.2162*** (5.57)	68.96 (13)	0.9444

Paper & paper products	11.7056 (3.19)	-2.0093** (-2.66)	1.8636*** (3.80)	0.0672* (2.03)	10.11 (13)	0.6949
Fabricated metal products	1.6428 (0.28)	-0.2772 (-0.36)	1.0746*** (3.50)	0.0872*** (3.51)	16.01 (13)	0.7896
Plastic products	8.0147 (2.49)	1.2384** (2.26)	-2.0798* (-2.15)	0.1716** (2.50)	3.57 (13)	0.3914
Other Mfg. Industries	4.4650 (0.67)	-0.1572 (-0.16)	0.4369 (0.98)	-0.0078 (-0.01)	2.87 (13)	0.3187
Glass & glass products	4.1361 (1.69)	-0.2702 (-0.73)	0.5760*** (6.60)	-0.0197 (-1.05)	30.31 (13)	0.8799
Embroidery of textile goods	-1.0777 (-1.07)	0.2280 (1.83)	0.5230 (1.35)	0.2045 (1.06)	37.46 (8)	0.9399
Rubber products	2.4074 (0.32)	-3.0136*** (-2.50)	5.4299*** (2.47)	-0.3552*** (-2.52)	2.38 (13)	0.2568
Non-electrical machinery	8.9391 (1.32)	-0.4281 (-0.50)	0.0541 (0.18)	0.0066 (0.11)	0.11 (12)	-0.3208
Wood & cork products	-1.2391 (-0.79)	0.8092*** (4.36)	-0.0289 (-0.14)	0.0210 (1.54)	10.74 (13)	0.7088
Animal feed	-3.4507 (-3.06)	0.7996** (2.26)	0.2421 (0.59)	0.1596** (2.81)	16.38 (13)	0.7936
Misc. prod. of petroleum & coal	-2.3438 (-1.16)	1.4028* (2.10)	-0.6529 (-1.21)	0.1349** (3.18)	12.04 (13)	0.734
Decorative handicrafts	-2.4649 (-1.45)	0.7234 (2.31)	0.1786 (1.14)	-0.0027 (-0.04)	611.11 (7)	0.9967
Photographic & optical goods	-3.5038 (-2.01)	1.0477** (3.01)	-0.2139 (-0.82)	0.0138 (0.43)	4.27 (13)	0.4497
Measuring instruments	1.3252 (0.34)	1.0524** (2.47)	-1.4796 (-1.02)	-0.1606 (-1.98)	6.76 (10)	0.6573
Petroleum refining	12.8132 (0.66)	-0.9023 (-0.39)	-0.1213 (-0.18)	0.0958 (0.91)	2.37 (8)	0.3705

Source: Calculated from CMI data.

Notes

* Significant at 10 percent

** Significant at 5 percent

*** Significant at 1 percent

Figures in parentheses represent 't' values.

Table-7.2: Manufacturing TFP Growth

Sectors	TFP growth (%)
Wearing apparel except footwear	-0.61
Drugs & pharmaceuticals	-0.42
Mfg. of textile	6.13**
Food manufacturing	0.68
Tobacco manufacturing	-3.27
Other chemical products	7.84***
Pottery & China-wear	5.59
Furniture & fixtures (wooden)	7.33
Ginning & processing of fibres	-0.13
Printing & publishing	0.92
Non-metallic mineral products	2.68
Leather footwear	5.85
Transport equipment	1.49
Electrical machinery	8.78**
Industrial chemicals	-1.88
Iron & steel basic industries	11.69***
Leather & leather products	-5.74**
Beverage industries	21.62***

Paper & paper products	6.72*
Fabricated metal products	8.72***
Plastic products	17.16**
Other Mfg. Industries	-0.08
Glass & glass products	-1.97
Embroidery of textile goods	20.45
Rubber products	-35.52***
Non-electrical machinery	0.66
Wood & cork products	2.10
Animal feed	15.96**
Misc. prod. of petroleum & coal	13.49**
Decorative handicrafts	-0.27
Photographic & optical goods	1.38
Measuring instruments	-16.06
Petroleum refining	9.58

Source: Calculated from CMI data.

Notes

* Significant at 10 percent

** Significant at 5 percent

*** Significant at 1 percent

Figures in parentheses represent 't' values.

Table-A7.3: Decomposition of Value Added Growth

	1990-1996			1996-2002		
	Growth of Value Added	Productivity ⁽¹⁾	Employment ⁽²⁾	Growth of Value Added	Productivity ⁽¹⁾	Employment ⁽²⁾
Wearing apparel except footwear	35.85	7.24	28.62	3.61	-5.75	9.36
Drugs & pharmaceuticals	9.92	7.98	1.94	32.61	3.42	29.19
Mfg. of textile	3.38	5.03	-1.65	8.79	9.31	-0.53
Food manufacturing	3.39	2.25	1.14	8.70	5.24	3.46
Tobacco manufacturing	31.90	38.28	-6.38	-15.62	-10.86	-4.77
Other chemical products	13.93	13.47	0.46	10.66	7.80	2.86
Pottery & China-wear	4.17	-1.56	5.73	53.44	-1.78	55.22
Furniture & fixtures (wooden)	15.58	17.26	-1.68	51.35	14.34	37.01
Ginning & processing of fibres	-17.50	-8.30	-9.19	90.06	98.87	-8.80
Printing & publishing	28.91	16.06	12.85	1.23	-4.49	5.72
Non-metallic mineral products	17.78	4.07	13.71	4.78	12.39	-7.61
Leather footwear	54.20	-3.49	57.69	-15.03	22.74	-37.77
Transport equipment	-20.09	-37.39	17.30	37.36	47.87	-10.50
Electrical machinery	11.97	-1.10	13.07	-4.59	15.73	-20.32
Industrial chemicals	-2.51	3.60	-6.11	-8.55	-11.26	2.72
Iron & steel basic industries	21.13	18.49	2.63	-12.74	-6.21	-6.53
Leather & leather products	-7.88	-8.97	1.09	13.67	6.29	7.39
Beverage industries	38.62	17.29	21.32	2.91	-4.60	7.51
Paper & paper products	0.73	4.60	-3.87	-13.50	-12.83	-0.67
Fabricated metal products	16.01	9.45	6.55	-11.42	-5.78	-5.64
Plastic products	-11.65	-23.21	11.57	22.66	13.32	9.35
Other Mfg. Industries	11.04	0.32	10.72	2.07	-4.82	6.88

Glass & glass products	7.89	-3.53	11.41	8.08	16.05	-7.97
Embroidery of textile goods	1.50			139.34		
	1990-1996			1996-2002		
	Growth of Value Added	Productivity ⁽¹⁾	Employment ⁽²⁾	Growth of Value Added	Productivity ⁽¹⁾	Employment ⁽²⁾
Rubber products	3.43	-1.23	4.66	6.97	12.65	-5.68
Non-electrical machinery	12.32	7.77	4.56	-11.19	-0.55	-10.64
Wood & cork products	-4.17	1.09	-5.25	-7.97	6.69	-14.66
Animal feed	-19.81	-0.51	-19.30	98.29	25.47	72.81
Misc. prod. of petroleum & coal	2.96	10.01	-7.05	42.51	5.54	36.97
Decorative handicrafts	3.55	10.95	-7.39	80.66	-6.42	87.08
Photographic & optical goods	8.74	-2.18	10.92	12.92	9.48	3.44
Measuring instruments	-3.34	-2.58	-0.76	-16.33	-16.46	0.13
Petroleum refining	12.45	16.27	-3.82			

Source: Calculated from CMI data.

Notes

⁽¹⁾ GDPgrowth divided by the sum of participation growth and productivity growth. Then the result is multiplied by the productivity growth.

⁽²⁾ GDPgrowth divided by the sum of participation growth and productivity growth. Then the result is multiplied by the employment growth.

Chapter 8

Gender Dimensions of Employment in Manufacturing Sub-sectors

It has been well recognized that women's engagement in income earning work can play an important role in their empowerment. In addition, the 'elastic supply' of labour to industries may continue only if women constitute a growing share of industrial labour force. Although Bangladesh is considered a 'surplus labour' economy, recent labour force surveys show that the magnitude of surplus male labour that can drawn to modern sectors is not large. In this context, women's employment in industry can play a useful role.

In this Chapter we shall examine the extent to which women are employed in the industrial sub-sectors and how far the gender composition of employment changed with time Sub-sectors with higher share of female employees are likely to have lower cost of employment (salary/wage). We shall present data on these two aspects.

Table 8.1 shows data on share of women out of total persons engaged in each sub-sector. In manufacturing as a whole, out of total persons engaged, 28 per cent are women. This is a significantly high share, given the fact that adult women's labour force participation rate is only 24 per cent, while men's LFPR is around 85 per cent. However, women's high share in manufacturing employment is due to their engagement in a single sub-sector, that is wearing apparel. Women constitute 63 per cent of all employment in this sector. Among the rest only three sub-sectors have higher than 10 per cent female employment. These are textile, food manufacturing and tobacco, followed by electrical machinery (8.1 per cent). These four sub-sectors have experienced a rising share of female employment. Share of women in wearing apparel sub-sector has declined from 66 per cent in 1996 to 63 per cent in 2002. Among other larger sub-sectors furniture & fixtures and leather footwear experienced a decline of women's share of employment.

The importance of growth of female employment and their rising share in a sub-sector's employment is magnified by the close association between growth of employment and growth of real wage/salary. This has been shown in Table 8.2. One can observe acceleration of growth of female employment along with acceleration of growth of wage/salary per person in the following sub-sectors:

Textile, food manufacturing, tobacco, non-metallic mineral, electrical machinery and industrial chemical.

Among the large sub-sectors, in drugs and pharmaceuticals, women's employment growth was much higher during 1996-2002 period compared to 1991-1996 period, but this was not accompanied by a rise in real wage. A matter of concern is that female employment and real wage declined in the following sectors: pottery & china ware, furniture and fixture, printing & publishing and leather footwear.

Table-8.1: Share of Women in Total Persons Engaged in Each Sub-sector 1991-2002
(per cent)

All Sector	2002	1996	1991
Wearing App except footwear	63.46	66.06	70.47
Drugs & Pharma	2.56	5.99	7.50
Mfg of Textiles	10.48	3.80	2.02
Food Manufacturing	11.11	5.83	5.59
Tobacco Manufacturing	12.28	5.29	6.06
Other Chemical Product	1.30	2.07	1.49
Pottery & Chinawares	.11	3.37	1.63
Furniture & Fixtures (wooden)	.59	16.29	10.89
Ginning & processing of fibers	.00	.16	.09
Printing & Publishing	.18	2.02	1.24
Non-metallic mineral prod	2.41	.20	1.25
Leather footwear	2.22	8.30	.00
Transport equipment	.73	.92	.88
Electrical machinery	8.07	1.02	2.12
Industrial chemicals	2.85	2.65	3.15
Iron & steel basic industries	.06	.04	.03
Leather & leather products	.00	.10	.18
Beverage industries	.00	9.99	.00
Paper & paper products	1.98	.99	.96
Fabricated metal products	2.95	1.40	.88
Plastic products	.25	1.82	.65

Source: Calculated from CMI data.

Table-8.2: Growth of Employment and Wage/Salary of female Employees

	Employment		Wage/Salary	
	1991-1996	1996-2002	1991-1996	1996-2002
Wearing App except footwear	26.36	10.30	43.84	5.93
Drugs & Pharma	2.08	10.82	7.56	.94
Mfg of Textiles	11.13	18.34	12.55	16.70
Food Manufacturing	4.30	15.15	10.15	11.23
Tobacco Manufacturing	-15.69	9.49	1.95	7.09
Other Chemical Product	7.53	-14.38	-6.22	16.87
Pottery & Chinawares	25.11	-26.70	14.68	-41.11
Furniture & Fixtures (wooden)	20.49	-22.00	61.51	-19.52
Ginning & processing of fibers	.00	-100.00	4.70	-100.00
Printing & Publishing	33.74	-20.70	47.36	-16.74
Non-metalic mineral prod	-18.81	58.70	12.43	36.54
Leather footwear	-	-41.01	-	-50.79
Transport equipment	20.06	-9.80	10.96	-22.13
Electrical machinery	-.52	18.65	-16.86	24.30
Industrial chemicals	-7.07	15.39	-28.23	16.18
Iron & steel basic industries	11.84	.00	35.11	-20.37
Leather & leather products	-6.73	-100.00	51.33	-100.00
Beverage industries	-	-100.00	-	-100.00
Paper & paper products	-7.57	11.50	-12.18	-9.72
Fabricated metal products	13.43	3.45	81.41	-34.10
Plastic products	31.66	-21.68	33.30	-29.59
Male				
Wearing App except footwear	31.63	12.42	44.60	9.25
Drugs & Pharma	7.11	28.49	10.87	30.11
Mfg of Textiles	-2.42	-1.26	-3.50	-.57
Food Manufacturing	3.34	2.44	7.54	1.85
Tobacco Manufacturing	-13.23	-6.05	12.05	-17.59
Other Chemical Product	.65	-7.38	-7.08	-9.46
Pottery & Chinawares	7.86	30.42	13.75	29.86
Furniture & Fixtures (wooden)	9.78	39.69	19.38	45.76
Ginning & processing of fibers	-11.73	-27.90	-1.27	-31.24
Printing & Publishing	21.05	19.12	37.64	10.21
Non-metalic mineral prod	17.48	4.32	23.10	5.37
Leather footwear	70.86	-25.69	47.92	-13.00
Transport equipment	19.06	-6.16	11.97	-3.84
Electrical machinery	15.48	-17.02	17.63	-11.12
Industrial chemicals	-3.70	13.97	3.09	3.66
Iron & steel basic industries	2.20	-5.66	-.90	-11.03
Leather & leather products	3.36	1.31	6.85	6.54
Beverage industries	27.35	12.22	34.08	15.11
Paper & paper products	-8.17	-.83	-14.97	-8.91
Fabricated metal products	3.24	-8.91	9.70	-12.83
Plastic products	6.83	8.99	2.39	13.56

Source: Calculated from CMI data.

Table-A8.1: Cost ('000' Tk.) of Employee by Sex: 1991-2002

All Sector	2002 Male	2002 Female	1996 Male	1996 Female	1991 Male	1991 Female
Wearing App except footwear	24	19	28	24	18	13
Drugs & Pharma	73	36	67	62	56	48
Mfg of Textiles	26	15	25	16	27	15
Food Manufacturing	30	13	31	16	26	12
Tobacco Manufacturing	25	19	56	22	16	9
Other Chemical Product	24	156	28	24	41	48
Pottery & Chinawares	35	3	36	11	27	17
Furniture & Fixtures (wooden)	38	27	29	22	19	5
Ginning & processing of fibers	25	-	33	55	19	43
Printing & Publishing	28	39	45	29	24	18
Non-metalic mineral prod	14	17	13	41	11	8
Leather footwear	90	7	35	21	72	-
Transport equipment	42	15	37	37	50	55
Electrical machinery	48	32	32	24	29	58
Industrial chemicals	47	47	83	45	59	165
Iron & steel basic industries	29	25	41	99	47	39
Leather & leather products	40	-	29	232	25	21
Beverage industries	35	-	30	18	23	-
Paper & paper products	20	14	34	49	50	63
Fabricated metal products	21	14	28	204	21	19
Plastic products	25	11	19	21	24	19

Source: Calculated from CMI data.

Chapter 9

Conclusions: Short Listing of Sub-Sectors

The objective behind the assessment of the manufacturing sub-sectors was to select sub-sectors for ongoing support through TVET and other skill development initiatives in the TVET Reform Project.

From the analysis in Chapters 4 to 8, seven sub-sectors were selected for the survey of enterprises, through which final selection of 3-4 sub-sectors will be done.

The seven sub-sectors selected were⁹:

- drugs and pharmaceuticals,
- textiles,
- food manufacturing,
- furniture & fixtures,
- pottery & china ware,
- leather & leather product, and
- transport equipment.

The selected sub-sectors each contribute more than one per cent of total value added in manufacturing. Their ranks in terms of value added are 2,3,4,7,8, 13 and 17.

All the selected ones have experienced acceleration of GVA growth between the two chosen sub-periods. Among the selected sub-sectors, five experienced positive growth of employment during the second sub-period (1996-2002). These are drugs & pharmaceuticals, food, pottery, furniture and leather. In contrast textile and transport equipment experienced reduction of employment. In the case of textile, this reflects the closure of some SOE which were incurring loss.

The selected sub-sectors are characterized by high to low-medium labour intensity. Those with low-medium labour intensity are expected to have competitive potential because these are characterized by high growth rate of employment (drugs & pharmaceuticals, for example).

All the chosen sub-sectors, except textiles experienced positive factor productivity for labour and fixed assets during both sub-periods. Among the chosen sub-sectors, positive export growth has been observed in drugs & pharmaceuticals, leather, textile, pottery and ceramic, transport equipment.

Thus, in terms of most indicators, the chosen sub-sectors show dynamism and competitiveness.

⁹ Wearing apparels has been excluded from the present list because it has already been included in a separate project.

Table-9.1: Some Basic Characteristics of the Selected Sub-sectors

Selected Sub-sectors	(Weight) Share of GVA 2001-02	Growth of GVA accelerated? (between 91-96 & 96-2002)	Growth of employment (1996-2002)	Labour intensity (2001-2002)
Wearing apparel	22.0	No	Med-high	High
Drugs & pharmaceuticals	17.9	Yes	High	Low-medium
Food mfg.	9.6	Yes	Low	High-medium
Pottery & China	3.1	Yes	High	High-medium
Furniture & fixture	2.9	Yes	High	High
Transport equipment	1.8	Yes	Negative	High
Leather & Leather Product	1.0	Yes	Med-low	High

Table-9.2: Other Characteristics of the Selected Sub-sectors

Sectors	Positive TFP growth	Labour productivity	Capital productivity	Whether labour productivity growth exceeded employment growth
Wearing apparel	No	Positive	Positive	No
Drugs and pharmaceuticals	No	Positive	Positive	Yes (1990-96)
Food manufacturing	Yes	Negative	Positive	Yes (1990-2002)
Pottery and china ware	Yes	Positive	Negative	Not available
Furniture and fixtures	Yes	Positive	Negative	Yes (1990-96)
Transport equipment	Yes	Negative	Positive	Yes (1996-02)
Leather and leather products	No	Positive	Negative	Not available

Chapter 10

Assessment of the Current Need for Skilled and Educated Workforce of the Industrial Sub-Sectors

In this and the following chapters, an attempt has been made to assess the current and future demand for skilled and educated workforce in the eight study sub-sectors and to identify suggestions on how to make the technical and vocational education and training (TVET) system more responsive to the labour market demand.

10.1 Mapping and Analyzing the Current Occupational and Skills Qualification Characteristics of the Workforces in the Sub-Sectors

The present section attempts to map out and analyze the current occupational and skills qualification characteristics of the workforces in the selected sub-sectors.

10.1.1 Current Mixes of the Educated and Skilled Workforces in the Sub-Sectors

A measure of the current mixes of the educated and skilled workforce in the companies is important in its own right because it represents the current labour market outcomes of occupations and skills which provide some useful information relating to the market for these occupations and skills since these occupations are a natural employment opportunity for people with these skills. Besides, measures of the education and skill levels of a workforce can be used to measure workforce quality.

The enterprise survey reveals that in all the study sub-sectors taken together, skilled workers account for the largest proportion of the total workforce (58.64%) followed in order by unskilled workers (29.38%), professional staff (10.72%) and clerical staff (1.27%). Across sub-sectors, however, there is wide variation in skill intensity¹⁰ with the highest proportion of the skilled workers in IT (70.62%), ceramics (70.58%), transport equipment (65.87%) and furniture (64.13%) and the lowest in leather (45.94%).

Table-10.1: Current Occupational and Skills Characteristics of the Workforces in the Sub-Sectors

Sub-Sector	N	Total senior engineering, managerial and other professional staff		Total clerks		Total skilled workers		Total unskilled workers		Total current employees	
		Number	%	Number	%	Number	%	Number	%	Number	%
Textiles	5	608	7.24	80	0.95	4931	58.72	2778	33.08	8397	100.0
Pharmaceuticals	5	1735	22.21	217	2.78	4648	61.09	1008	12.90	7608	100.0
Food	5	130	3.83	36	1.06	1891	55.67	1340	39.45	3397	100.0

¹⁰ Skill intensity is defined as the proportion of the skilled workers to the total workforce.

Manufacturing											
Ceramics	4	197	10.71	9	0.49	1298	70.58	335	18.22	1839	100.0
Furniture	5	513	12.24	48	1.15	2687	64.13	942	22.48	4190	100.0
Transport Equipment	4	307	11.94	23	0.90	1700	65.87	551	21.43	2581	100.0
Leather & Leather Goods	4	343	4.54	30	0.40	3470	45.94	3711	49.13	7554	100.0
Information Technology	4	72	16.40	18	4.10	310	70.62	39	8.88	439	100.0
All Sub-Sectors	36	3905	10.85	461	1.28	20935	58.14	10704	29.73	36005	100.0

10.1.2 Dynamics of Skilled Employment Evolving over Time in the Sub-Sectors

The proportion of highly skilled and skilled workers which constitute the nucleus or mainstay of skilled workers in the shop floor is overwhelming (Table-10.2). Interviews with the employers reveal that changes in the skill demand in the surveyed enterprises have evolved over time primarily due to expansion of the production capacity and changes in technology. There is no incidence of vacancies in skilled occupations in textiles and transport equipment reflecting that there is no excess demand for skills in these sub-sectors. In the remaining sectors, however, the incidence of vacancies in skilled occupations varies widely from 0.34% in leather to 8.2% in furniture indicating that there exists excess demand for skills in these sub-sectors predominantly in furniture, food manufacturing and IT.

The findings also suggest that the average training time required for highly skilled workers is 16.86 months ranging from 12 months in leather and IT to 28 months in transport equipment. The average training time required for skilled workers is 8.22 months ranging from 5.4 months in textiles to 13.5 months in food manufacturing. For semi-skilled worker, the average training time required is 4.05 months ranging from 3 months in leather and IT to 5.25 months in food manufacturing and transport equipment.

Table-10.2: Occupational and Qualification Structures of Workers in the Workshop

Sub-Sector	N	Number of workers with Identifiable skills levels											Total workers with skills (a+b+c+d)		Number of vacancies in each skilled occupation (e)		Total number of jobs in each skilled occupation (a+b+c+d+e)	Total unskilled workers in the workshop
		Highly Skilled (a)			Skilled (b)			Semi-Skilled (c)			Apprentices acquiring skills on-the-job (d)							
		Number	%	Training Time (Months)	Number	%	Training Time (Months)	Number	%	Training Time (Months)	Number	%	Number	%	Num ber	%		
Textiles	5	2370	48.06	13.2	988	20.04	5.4	796	16.14	4.28	777	15.78	4931	100.00	0	0	4931	2778
Pharmaceutica ls	5	1259	26.10	13.6	1408	29.19	8.4	1118	23.18	4.5	863	17.89	4648	96.37	175	3.63	4823	1008
Food Manufacturing	5	935	45.88	24	303	14.87	13.5	398	19.53	5.25	255	12.51	1891	92.79	147	7.21	2038	1340
Ceramics	4	190	14.59	16.5	668	50.31	6.75	336	25.87	3.5	104	7.99	1298	99.69	4	0.31	1302	335
Furniture	5	333	11.38	15.6	1016	34.71	7.2	1003	34.27	3.6	335	11.45	2687	91.80	240	8.20	2927	942
Transport Equipment	4	745	43.83	28	217	12.76	10.5	610	35.88	5.25	128	7.53	1700	100.00	0	0	1700	551
Leather & Leather Goods	4	942	27.15	12	898	25.79	8	496	14.24	3	1134	32.57	3470	99.66	12	0.34	3482	3711
Information Technology	4	185	55.72	12	75	22.59	6	40	12.05	3	10	3.01	310	93.37	22	6.63	332	39
All Sub-Sectors	36	6959	32.31	16.86	5573	25.88	8.22	4797	22.28	4.05	3606	16.74	20935	97.21	600	2.79	21535	10704

On-the-Job and Off-the-Job Training

Across all sub-sectors, on-the-job training accounts for the single most important source of training the workforce in the study enterprises ranging from 79.58% in furniture making to 100% in food manufacturing. This suggests that skill formation in the study sub-sectors consists most predominantly of on-the-job training within the enterprises. In addition to the IT sector (10.42%), in manufacturing, only the furniture sector outsources a considerable proportion of its workforce training (20.42%). This highlights the importance of off-the-job training in these sub-sectors compared to other sectors. These findings corroborate earlier studies such as ADB (2007) which used anecdotal evidence to suggest that the majority of workers in the industrial sectors mainly acquire their skills on-the-job.

The annual average number of days spent in on-the-job training works out at 70.39 ranging from 12.2 in textiles to 227.5 in leather and leather goods, compared to 44.43 in off-the-job training, ranging from 11 in textiles to 150 in ceramics and transport equipment (Table-10.3). This suggests that off-the-job training could assist skills development in those sectors where longer periods of on-the-job training are required to develop skilled workers. Interestingly, the survey results indicate that food manufacturing does not utilize any off-the-job training. The survey found that ‘intellectual skills’ and ‘capacity for flexibility in performing many interrelated jobs’ form the most important content of necessary skill on the contemporary shop floor.

On-the-job training is the principal way in which these skills are formed. There are two reasons for the importance of on-the-job training: The first is the character of skill itself. The knowledge of a skill is largely indefinable and only partially communicated through words. There exists no way to acquire these skills other than by following the teacher’s pattern, which is precisely the content of on-the-job training on the job floor. The second reason for the importance of on-the-job training is simply that it costs less than off-the-job training (Koike & Inoki, 1990) as seen in Table-10.3. An important factor in the success of on-the-job training is its concrete character. The other factor is that on-the-job training is tailored to the aptitude of each individual worker.

However, on-the-job training tends to obscure the distinction between training and work, because priority is often given to production activities. Enabling intellectual skills cannot be fully developed through broad on-the-job training alone. On-the-job training needs to be supplemented by short and periodic off-the-job training which affords a worker the opportunity to theorize or systematize job experience and to form intellectual skills which enable workers to deal with unusual operations. Besides, on-the-job training has mixed effects on wages – it may not increase lifetime income of the workers. All this points to the need for developing versatile or all-round skilled workers of high adaptability. An all-round skilled worker well equipped with widely varied practical skills, scientific and technical knowledge, logical thinking and good judgment i.e. equipped with “brains” and “skill” is a driving force of adaptability (ILO, 1988). In developing all-round skilled workers, securing gifted trainees who have high learning potentials is a prerequisite. *Two approaches may be considered for developing highly adaptable all-round skilled persons: One is to organize the teaching materials by compiling those factors that will form the common foundation of knowledge and skill. The other is to shape the training to conform with those more or less permanent jobs that will not be dramatically changed by*

technological progress. The second approach may be favoured due to the obscurity of the “common foundation” element of the first approach.

Table-10.3: Extent of On-the-job and Off-the-job training of the Workforces in the Sub-Sectors

Sub-Sector	N	Annual on-the-job trainees				Annual off-the-job trainees				Annual total trainees	
		Number of trainees	%	% of the payroll spent	Number of training days	Number of trainees	%	% of the payroll spent	Number of training days	Number	%
Textiles	5	4496	95.70	1.33(5)	12.2(5)	202	4.30	1.50(2)	11.0(2)	4698	100.0
Pharmaceuticals	5	1579	97.17	3.55(5)	49.2(5)	46	2.83	2.63(4)	28.5(4)	1625	100.0
Food Manufacturing	5	115	100.0	1.72(5)	69.4(5)	0	0	0	0	115	100.0
Ceramics	4	328	99.09	3.15(4)	78.5(4)	3	0.9	10(1)	150.0(1)	331	100.0
Furniture	5	265	79.58	3.12(5)	78.8(5)	68	20.42	1.83(3)	13.0(3)	333	100.0
Transport Equipment	4	1086	97.32	1.33(3)	29.0(4)	30	2.68	2.33(3)	150.0(1)	1116	100.0
Leather & Leather Goods	4	4400	99.77	4.07(2)	227.5 (2)	10	0.23	1.5(1)	42 (1)	4410	100.0
Information Technology	4	275	89.58	9.25(4)	130(3)	32	10.42	11.67(3)	52.5(2)	307	100.0
All Sub-Sectors	36	12544	96.90	3.34	70.39	391	3.02	4.26	44.43	12935	100.0

Apprenticeship in the Enterprises

Apprenticeship arrangements greatly contribute to skill formation practices in many countries, either through a formal and regulated system or through informal arrangements negotiated between a master craftsman and young employee. Table-10.3 reveals that apprenticeships are of overriding importance in the study sub-sectors. However, the study enterprises define an apprentice in different ways (Table-10.4).

The most common definition provided by them is that a person who is learning a job is an apprentice. The other definitions remain mostly unclear and unarticulated. In essence, these definitions indicate that informal apprenticeships exist in these sectors, rooted in the traditions and cultural norms of a particular industry, rather than formal apprenticeships regulated by legislation. Consequently, they do not provide any uniform system or standard that compares with the definition of apprenticeship in the Bangladesh Labour Law-2006¹¹ or ILO definition.¹²

¹¹ According to Bangladesh Labour Law-2006, “Apprenticeship means any such training method in which any employer is willing to train or to make arrangement to train any person by appointing him and registering him in any apprenticeable trade or vocation for a predetermined period, and for that period the concerned apprentice is liable to serve under the employer”.

¹² According to the ILO Apprenticeship Recommendation No.60 (1939), “the expression apprenticeship means any system by which an employer undertakes by contract to employ a young person and to train him or have him trained systematically for a trade for a period the duration of which has been fixed in advance and in the course of which the apprentice is bound to work in the employer's service.”

Table-10.4: Definition of Apprentice by the Enterprises

Sub- Sector	N	Definition	Frequency
Textile	5	• One who is learning a job • Employment status • Monthly salary • Contract pay	2 1 1 1
Pharmaceutical	5	• One who is learning a job • Training with employment status • Employed on daily basis	2 1 2
Food Manufacturing	5	• Accommodation and training allowance • Learning a new job • No work no pay • Employment status	2 1 1 1
Ceramics	4	• One who is learning a job • Daily payment	3 1
Furniture	5	• One who is learning a job • Contract basis • Monthly salary basis	2 1 1
Transport Equipment	4	• One who is learning a job • Contractual basis	3 1
Leather and Leather Goods	4	• Continuing process • One who is learning a new job	1 3
Information Technology	4	• Subsistence allowance basis	1

According to the definitions in Table-10.4, apprenticeable trades in the study sub-sectors are many and multi-dimensional. Duration of apprenticeships differs from one month to one year resulting in semi-skilled or skilled workers (Table-10.5) depending upon the type and nature of trade.

Apprenticeships involve special problems, particularly because it is given in undertakings and involves contractual relations between master and apprentice. The efficacy of apprenticeship largely depends on the satisfactory definition and observance of the conditions governing apprenticeship and, in particular, of those relating to the mutual rights and obligations of master and apprentice.

Table-10.5: Apprenticeship in the Enterprise/Company

Sub- Sector	N	Major Apprenticable Trades	Duration of Apprenticeship	Skill Level of Workforces upon Finishing Apprenticeship
Textile	5	(i) Machine Operation (ii) Packaging (iii) Helper (iv) Mechanical (v) Production (vi) Administration (vii) Secretarial Service (viii) Machine Maintenance.	1 Month 3 to 6 Months 6 Months	Semi-skilled
Pharmaceutical	5	(i) Machine Operation (ii) Boiler Operation (iii) General Worker (iv) Pellet Operation (v) Helper (vi) Store keeping (vii) Production (viii) Quality Control (ix) HSE Operation	1 Month 3 to 6 Months 6 Months	Semi-skilled Skilled
Food Manufacturing	5	(i) Machine Operation (ii) General Worker (iii) Helper (iv) Store keeping (v) Production (vi) Accounting (vii) Marketing (viii) Lab Assistant	3 Months 4 Months 6 Months 1 Years	Semi-skilled
Ceramics	4	(i) Engineering (ii) Supervisor (iii) Machine Operation (iv) General Worker (v) Helper	3 to 6 Months 6 Months	Semi-skilled Skilled
Furniture	5	(i) Carpenter (ii) Machine maintenance (iii) Polisher (iv) Sewing (v) Finishing (vi) Management training (vii) Upholstery	3 Months 3 to 6 Months	Semi-skilled Skilled
Transport Equipment	4	(i) Pipe fitters (ii) Welding (iii) Fitters (iv) Quality Controller (v) Machine Operation (vi) Semi-skilled Worker (vii) Ship building technology (viii) Draftsmanship (ix) Mechanic (x) Crane Operation (xi) Helper	3 to 6 Months 1 Year	Semi-skilled
Leather and Leather Goods	4	(i) Machine Operation (ii) Cutting (iii) Sewing (iv) Worker	3 Months 3 to 6 Months 6 Month 1 Year	Semi-skilled Skilled
Information Technology	4	(i) Software Development (ii) Web Designing (iii) Desk top Publishing	3 Months	Semi-skilled

	(iv) Auto Cad		
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Bangladesh Labour Law-2006 has provision for Tripartite Advisory Committee and defines the responsibilities of both the employers and the apprentices. But it seems to be silent on the issue of remuneration of the apprentices. It appears that provision should be made in the contract of apprenticeship as to how any remuneration in cash or otherwise due to the apprentice should be determined and as to the scale of increase in remuneration during the course of the apprenticeship. Provision should also be made in the contract of apprenticeship in respect of (a) the remuneration during sickness; and (b) holidays with pay. It would be desirable that the parties concerned in apprenticeship and more particularly the organisations of employers and workers should collaborate with the official bodies responsible for the supervision of apprenticeship. Close collaboration should be maintained between the bodies responsible for the supervision of apprenticeship and the TVET authorities, vocational guidance institutions, 21 District Employment and Manpower Offices of BMET and the Department of Inspection for Factories and Establishments. By and large, strengthened apprenticeship arrangements and more effective on-the-job skills training provide improved protection for young workers and greater opportunities for more decent work.

10.2 Existing National Criteria for the Qualification Levels of Workers

In Bangladesh, the national criteria for the qualification levels of workers (e.g. highly-skilled, skilled, semi-skilled, unskilled) exist sporadically and on a limited degree. In this section, attempt has been made to develop such criteria in close consultation with the industries, Bureau of Manpower, Employment and Training (BMET), Directorate of Technical Education (DTE) and Bangladesh Technical Education Board (BTEB) that befit the national situation.

In the survey enterprises, levels of worker skills were defined in a number of ways. They were:

- the number of years of practical work experience (91.41%)
- an assessment of the tasks that workers can accomplish (88.55%)
- the period of on-the-job training (81.67%); and
- whether the worker holds a formal certificate acquired in a TVET institution (56.67%).

Table 10.6 provides further detail for each of the target sectors. It can be seen that even within individual companies, there exists different approaches to categorizing skill levels of workers.

Table-10.6: Frequency Distribution of the Ways the Companies Define Levels of Worker Skills

Sub-Sector	N	Months or years of on-the-job training		Formal certificate acquired in a TVET institution		Number of years of practical work in a company		Through the assessment of tasks that workers can accomplish/ personal talent	
		Frequency	%	Frequency	%	Frequency	%	Frequency	%
Textiles	5	4	80.0	1	20.0	5	100.0	3	60.0
Pharmaceuticals	5	4	80.0	3	60.0	3	60.0	4	80.0
Food Manufacturing	5	5	100.0	1	20.0	4	80.0	4	80.0
Ceramics	4	2	50.0	2	50.0	3	75.0	3	75.0
Furniture	5	4	80.0	2	40.0	5	100.0	5	100.0
Transport Equipment	4	4	100.0	4	100.0	4	100.0	4	100.0
Leather & Leather Goods	4	2	50.0	1	25.0	4	100.0	4	100.0
Information Technology	4	3	75.0	1	25.0	4	100.0	4	100.0
All Sub-Sectors	36	28	81.67	15	56.67	32	91.41	31	88.55

Skill Standards Defined by National Council for Skill Development and Training

The formal or informal permit/licensing/competence certification systems are in practice in Bangladesh for a long time. However, the scope of the TVET sub-sector encompasses a large number of institutions and activities. Its impact has hardly been felt, partly because its various components lack a unifying vision in which each has a clearly defined role. The need to rationalize the disparate efforts in TVET by putting it under a single regulatory framework to provide a unified and coherent direction was officially recognized with the creation of the National Council for Skills Development and Training (NCSDT) in 1979. NCSDT was to provide macro-level policy direction and other national services related to skills training, coordinate the efforts of different agencies involved in skills training to avoid duplication of efforts, and develop national competency standards. Despite the reconstitution of its membership in 1991, NCSDT has not functioned as intended. Several factors have been cited for its lack of effectiveness, including (i) membership is too big and difficult to coordinate and organize, although this was partly addressed in the revised composition; (ii) many members have neither the expertise nor interest in formulating policies relating to the development of the workforce for crafts; (iii) the NCSDT secretariat, BMET, does not have sufficient resources and expertise to provide the necessary support to NCSDT; and (iv) BMET lacks autonomy, which is needed for effective functioning as the NCSDT secretariat.

While the initial attempt to provide a unified governance and management structure did not work as expected, the need for it remains even more valid and urgent today. The options are either to reactivate NCSDT and build on the existing legal framework, or create a completely new but equivalent body. Presently, Ministry of Education (MOE) has overall responsibility for making policy decisions for all types of education, including technical and vocational education. The

execution of policies relating to technical and vocational education is vested in two of its agencies – DTE and BTEB. Under the existing institutional arrangements, a major component is conspicuously missing – the involvement of private sector representatives, including employers, private training providers and NGOs. They need to be involved not only for strategy and policy making but also for their implementation.

However, NCSDT remains the national apex body to coordinate all efforts in skill training development, to set national skill standards (NSS) and to introduce testing and certification through tripartite Trade Advisory Committees in Bangladesh. For the implementation of the World Bank IDA project, the government entered into an agreement with the ILO for the latter to provide various technical assistance including expert service necessary for implementation of the project. Thus, ILO became directly involved in the introduction of occupational skill standards (OSS) termed as NSS.

In 1984, 37 NSS with respect to 13 basic engineering trades (most of which were being taught in the training institutes) were approved by the NCSDT. Each trade was normally covered with a three-tier standard, such as NSS Grade-I, Grade-II and Grade-III. Generally, Grade-III indicates semi-skilled level, Grade-II represents skilled level and Grade-I is meant for highly skilled level of workers in the concerned trade. However, some trades have only two Grades: Grade-II and Grade-I as found appropriate.

After approval of 37 skill standards, it was decided to redesign the public sector institutional training programmes to meet the requirements of the standards with the expectation to introduce tripartite testing and certification by the Directorate of Training Standard of the BMET, which was to provide all necessary secretarial service to NCSDT. The ILO experts designed some tests too and arrangements were made to validate those before offering them publicly.

Skill standards developed by ILO/APSDEP were generally followed by NCSDT. Each standard contained a statement captioned General Principles explaining the division into Grades, procedure for a test, payment of fees and the kind of certificate to be issued. The standards so developed clearly defined knowledge requirements and skill requirements. Where applicable the standard contained small sections stating Limitations and Prerequisites for appearing at the test.

Following the approval of these standards, the BMET drafted more standards for some more trades despite acute shortage of expertise and manpower. Some of them have already gone through the process of scrutiny by the industry, specialized enterprises and experts in business and drafts have been finalized by the Planning and Development Committee of the NCSDT to be placed for final approval of the NCSDT. Other standards were in different stages of development.

Occupational Qualifications and Quality Assurance Procedures

The NCSDT appreciated the need for the establishment of NSS that will give the government and other users a basis for determining occupations that are of nationwide validity and also a

basis for certifying occupational competence. The NCSDT then approved three OSS termed as NSS. Later on, BTEB added two more standards. The final shape of skill standards with the corresponding academic requirements as well as the providers or the institutions involved is shown in Table-10.7.

Table-10.7: National Skills Standards

National Skills Standards	Skill Level	Year/Month of Schooling	Competency level (Capable of Doing)	Providers/ Institutions
NSS (Basic)	Basic Skilled	360 hours (3 to 9 Months)	Routine/Repetitive job under 100% supervision	TSCs, TTCs, UCEP and other NGOs
NSS III	Semi-Skilled	1 Year	Routine/Repetitive job under minimum supervision and new job under direct supervision	TSCs, TTCs, General Schools, UCEP and Other NGOs
NSS II	Skilled	2 Years (including Class IX)	Routine/Repetitive job without supervision and new/complex job with supervision	TSCs, TTCs, General Schools, UCEP and Other NGOs
NSS I	Highly Skilled	2 Years		TSCs, Private Colleges
Master	Master Craftsman		Planning of new complex job coordination and supervision of activities of a group of workers and education and control of quality of works	In the world of work (workplace assessment)

When viewed against the skill standards developed within the TVET system of Bangladesh (Table-10.7), it is clear that what industry uses as the basis of categorizing skill has no connection with the skill categories developed by BTEB, DTE and BMET.

10.3 Proposed National Criteria in the Sub-Sectors under Review

In the light of the above findings and analysis, it is arguable that more appropriate national criteria for the qualification levels of the workers need to be made. Possible criteria for skill measurement may include: (i) level of basic education, (ii) length of training, (iii) course contents of training, (iv) work experience, and (v) productivity performance.

The national skill framework should include a credible system of certification which will ensure that skills are portable and recognized across sectors, industries, enterprises and educational institutions. Special provisions should be designed to ensure recognition and certification of skills and qualifications for migrant workers. In cooperation with the social partners, it is necessary to promote diversity of training provision to meet the different needs of individuals and enterprises and to ensure high- quality standards, recognition and portability of competencies and qualifications within a national quality assurance framework.

10.4 Assessment of the Skill-Intensive Employment Potential of the Sub-Sectors

10.4.1 Unlocking the Skill-Intensive Employment Potential

Relative shares of employees in different occupations and skills presented in Table-10.1 and Table-10.2 indicate that there is large potential for generating skill-intensive employment in the study sub-sectors.

In order to realize the skill-intensive employment potential of the study sub-sectors, it is necessary to stress the importance of innovation, competitiveness, productivity, and the creation of decent jobs and the employability of people. New employment opportunities also require new approaches to education and training to meet the demand for new skills. In this context, there is a need to develop a national qualifications framework to assist enterprises and employment agencies to match skill demand with skill supply, guide individuals in their choice of training and career, and facilitate the recognition of prior learning and previously acquired skills, competencies and experience. This framework should be responsive to changing technology and trends in the labour market. By and large, there is a critical need for a national framework of skills testing, certification and international accreditation.

10.4.2 Relative Shares of Employees “with” and “without” Formal Credentials by Sub-Sector and Qualification Level

In all the sub-sectors taken together, 58.29% of the professional staff have formal degrees/higher degrees with 24.19% of them having diploma/advanced diploma and 13.11% of them having certificates. While 2.47% of them have not completed any degree/certificate, about 2% of them have no qualification.

Across sub-sectors, there is sharp variation in the proportion of professional staff with degrees/higher degrees ranging from 29.66% in leather to 85.56% in IT. The largest proportion of the staff with diploma/advanced diploma is seen in the case of leather (52.51%) followed in order by furniture (38.48%).

Table-10.8: Qualification Profiles of Professional and Paraprofessional Staff in the Sub-Sectors

Sub-Sector	N	Total Number of Staff	Degree/ Higher Degree	Diploma/ Advanced Diploma	Certificate	Not Completed	No Qualificati on
			%	%	%	%	%
Textiles	5	688	48.51	25.05	16.02	5.28	4.59
Pharmaceuticals	5	1952	62.91	9.35	27.74	0.00	.00
Food Manufacturing	5	166	69.75	13.03	14.20	0.00	3.01
Ceramics	4	206	65.61	29.15	4.27	0.97	.00
Furniture	5	561	37.69	38.48	15.01	6.23	2.58
Transport Equipment	4	330	69.59	27.58	1.88	0.23	0.73
Leather & Leather Goods	4	373	29.66	52.51	14.21	3.08	0.54
Information Technology	4	90	85.56	1.11	6.44	3.56	3.33

All Sub-Sectors	36	4366	58.29	24.19	13.11	2.47	1.93
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In sharp contrast with the qualification profiles of professional and paraprofessional staff, 58.57% of the workers have no qualification (Table-10.9). Only 13.17% of them have diploma/advanced diploma with 28.26% of them having certificates.

Across sub-sectors, nonqualified workers are most predominant in ceramics (95.4%) followed in order by food manufacturing (86.9%), leather (78.93%) and textiles (69.4%). While pharmaceuticals accounts for the lowest proportion of nonqualified workers, IT records no nonqualified workers.

Most of the workers in pharmaceuticals are certificate holders (60.77%). The proportion of workers with diploma is the highest in IT (100%) reflecting the sector's exclusive demand for qualified workers with the lowest in leather (0.1%) and ceramics (0.75%) indicating these sector's minimal demand for qualified workers with formal credentials.

Table-10.9: Qualification Profiles of Workers in the Sub-Sectors

Sub-Sector	N	Total Numbers of Workers	Diploma/Advanced Diploma	Certificate	No Qualification
			%	%	%
Textiles	5	7709	5.70	24.86	69.44
Pharmaceuticals	5	5656	30.99	60.77	8.24
Food Manufacturing	5	3231	5.51	7.95	86.90
Ceramics	4	1633	0.75	3.85	95.40
Furniture	5	3629	22.62	25.90	51.46
Transport Equipment	4	2251	27.03	36.78	36.18
Leather & Leather Goods	4	7181	0.10	20.96	78.93
Information Technology	4	349	100.00	0.00	0.00
All Sub-Sectors	36	31639	13.17	28.26	58.57

10.4.3 Qualification Levels Assignable to Fresh TVET Graduates

There are significant issues related to the quantity, quality and relevance of the TVET system which need to be addressed in order to improve its linkages with and responsiveness to the job market needs. This section addresses these issues and analyzes qualification levels assigned by the companies to fresh TVET graduates.

The enterprise survey reveals that 30 (83.33%) out of 36 enterprises employ TVET graduates. An equal number of enterprises prefer to recruit TVET graduates. According to most of the enterprises, TVET graduates are doing better work (Table-10.10). As reported by the enterprises, among the reasons for their doing better work the most important is that they are faster learners. Other important reasons are that they are more polite, productive and accurate and have sound theoretical knowledge.

Table-10.10: Comparative Analysis of TVET Graduates

Sub-Sector	N	Employ TVET Graduates	Prefer to Recruit TVET Graduates	TVET Graduates Doing Better Work	Reasons for Doing Better Work by TVET Graduates					
					More Productive	Faster Learner	More Accurate	Sound Theoretical Knowledge	Better Communication /More Responsive	More Polite
Textiles	5	5	4	5	2 (40.0)	2 (40.0)	1 (20.0)	1 (20.0)	1 (20.0)	0
Pharmaceuticals	5	5	5	5	3 (60.0)	3 (60.0)	0	0	1 (20.0)	2 (40.0)
Food Manufacturing	5	3	4	3	1 (33.3)	2 66.7	1 (33.3)	0	0	2 (66.7)
Ceramics	4	4	3	3	1 (33.3)	2 (66.7)	0	0	0	1 (33.3)
Furniture	5	4	5	4	2 (50.0)	4 (100.0)	2 (50.0)	0	0	0
Transport Equipment	4	4	3	4	0	4 (100.0)	0	0	0	0
Leather & Leather Goods	4	3	3	2	0	1 (50.00)	0	1 (50.0)	0	0
Information Technology	4	2	3	1	0	1 (100.0)	0	0	0	0
Total Cases	36	30	30	27	9 (47.44)	19 (77.73)	4 (38.33)	2 (35.0)	2 (20.0)	5 (49.34)

Note: Figures in the parentheses represent percentages.

TVET Issues

Adequacy of the Supply of Trained Graduates

Less than half of the enterprises surveyed reported that supply of trained graduates from the TVET system, irrespective of public or private providers, is adequate (Table-10.11 & Table-10.13). This suggests that there is either inadequacy in the number of training institutes and teachers/ trainers or underutilization of the existing capacity. All the survey enterprises report that shortage of training institutes, especially institutes of relevant trades, is the most important factor contributing to inadequate supply of trained graduates. Among other factors are poor management and poor technology. Shortage of quality training institutes also partly explains the limited supply of trained persons (Table-10.12 & Table-10.14).

Table-10.11: Adequacy of Supply, Quality and Relevance for Formally Trained Workers

Sub-Sector	N	Adequate Supply		Adequate Quality		Relevance	
		Public Provider	Private Provider	Public Provider	Private Provider	Public Provider	Private Provider
Textiles	5	1	1	2	2	2	2
Pharmaceuticals	5	3	3	2	2	2	2
Food Manufacturing	5	4	4	1	1	1	1
Ceramics	4	2	2	3	3	2	2
Furniture	5	0	0	1	1	2	2
Transport Equipment	4	2	2	3	3	1	1
Leather & Leather Goods	4	0	0	0	0	0	0
Information Technology	4	3	2	2	2	2	2
Total Case	36	15	14	14	14	12	12

Training Quality

A little more than one-third of the enterprises reported that training quality is adequate (Table-10.11 & Table-10.13) implying that problem of poor training quality figures very prominently in most cases. Among the factors accountable for the poor quality of training are lack of practical knowledge, poor work culture of the institutes, inability of the training institutes to provide quality training, outdated technology and teaching system, outdated curriculum, lack of awareness of training institutes about industry needs, poor management of the institutes, the unsatisfactory quality of the teachers, outdated technical training system, lack of modern technical knowledge, lack of training accuracy, poor receptivity of workers, teachers not well trained according to the companies need, and provision of mainly theoretical knowledge (Table-10.12 & Table-10.14).

Table-10.12: Factors Accounting for Inadequate Supply, Quality and Relevance for the Formally Trained Workers

Sub-Sector	N	Not Adequate Supply	Not Adequate Quality	Not Relevant
Textiles	5	.Shortage of institute	.Lack of practical knowledge	.Course curriculum does not meet industry needs .Lack of modern technical knowledge
Pharmaceuticals	5	.Shortage of institute	.Poor work culture of the institutes .Training institutes do not	.Outdated curriculum .Lack of practical knowledge

			provide quality training	
Food Manufacturing	5	.No institute on relevant trade .Poor management	.Outdated technology & teaching system	.Outdated curriculum
Ceramics	4	.Shortage of institute	.Lack of practical knowledge	. Lack of modern technical know-how .Have no practical knowledge.
Furniture	5	.No institution for furniture. .Poor management and technology	.Outdated technology & teaching system	.Outdated curriculum
Transport Equipment	4	.Lack of industry relevant institute	.Outdated curriculum	.Outdated curriculum.
Leather & Leather Goods	4	.Shortage of institute	.Training institute not aware about industry needs .Poor management	.Outdated curriculum
Information Technology	4	.Shortage of institute	.The quality of teachers is not satisfactory	.Lack of resources of the institutes (e.g. modern equipment)

Relevance of Training Programmes

The key measure of success of the TVET system is whether its graduates find gainful employment, preferably in the trades they are trained for. Only one-third of the enterprises surveyed reported that TVET training programmes are relevant (Table-10.11 & Table-10.13) reflecting that for majority of the enterprises the TVET programmes are irrelevant. This finding is corroborated by a World Bank tracer study conducted in 2006. The study using a sample of 2302 graduates of public and private TVET institutions in 2003 found the proportion of the employed to be very low. The proportion of employed was highest among the HSC (Voc) graduates at 30%, followed by diploma graduates at 21%, and basic trades at 18%. These training courses, however, account for only a small proportion of the total enrollment. While the lowest proportions of the employed were among the SSC (Voc) graduates (4%) and HSC (business management) graduates (5%), the proportions of their graduates pursuing higher education were the highest. This finding of the tracer study implies that these courses cater only to a clientele who can afford to pursue higher education and have strong white-collar job aspirations. Only 9% of all the respondents reported to be employed, 45% were pursuing higher education and the rest were unemployed. Of the employed to get a job while about 38% took less than 6 months, another 16% took up to a year. There is little difference in the employment outcomes of graduates of the public and the private institutions (WB, 2006).

However, the enterprise survey indicates that factors accountable for the irrelevance of the TVET system include: course curriculum not meeting industry needs because of absence of industry relevant subject matters in the course curriculum or outdated curriculum, lack of practical knowledge, lack of modern technical knowledge, lack of resources of the training institutes (e.g. modern equipment),

and lack of organizational and management behaviour of the training institutes (Table-10.12 & Table-10.14).

By and large, the low level of employment of TVET graduates reflects the lack of linkage of the TVET system with the labour market. The identification of training courses is not based on regular and systematic assessment of market needs. For all practical purposes, the employers have very limited or no role in setting competency standards for the courses or in determining the course curriculum which remains mostly outdated. TVET programmes, which incorporate modules on entrepreneurship, can be mainstreamed by converting to competency-based training (CBT) and recognized by BTEB so that they can be scaled up with Government and development agency support. The CBT approach to skills training accords great emphasis on the acquisition of skills used in the workplace.

Table-10.13: Adequacy of Supply, Quality and Relevance for Diploma Level Workers

Sub-Sector	N	Adequate Supply		Quality		Relevance	
		Public Provider	Private Provider	Public Provider	Private Provider	Public Provider	Private Provider
Textiles	5	2	2	3	3	2	1
Pharmaceuticals	5	4	4	2	2	2	2
Food Manufacturing	5	0	0	1	1	1	1
Ceramics	4	2	2	3	3	3	3
Furniture	5	0	0	2	2	1	1
Transport Equipment	4	2	2	3	3	1	1
Leather & Leather Goods	4	0	0	0	0	0	0
Information Technology	4	3	2	2	2	1	1
Total Case	36	13	12	16	16	11	10

Table-10.14: Factors Accounting for Inadequate Supply, Quality and Relevance for the Diploma Level Workers

Sub-Sector	N	Not Adequate Supply	Not Adequate Quality	Not Relevant
Textiles	5	.Shortage of institution	.Outdated technical training system .Lack of modern technical knowledge	.Outdated curriculum .No practical knowledge
Pharmaceuticals	5	.Shortage of institution	.Lack of training accuracy	.Outdated curriculum. .No practical knowledge.

			.Poor receptivity of workers	
Food Manufacturing	5	.Shortage of institution	.Outdated teaching system	.Outdated curriculum.
Ceramics	4	.Shortage of institution.	.Teachers are not well trained according to the companies need	.No practical knowledge.
Furniture	5	.Shortage of institution.	.Mainly theoretical knowledge is provided	.Lack of organizational and management behaviour of the training institutes
Transport Equipment	4	.Lack of industry relevant institutes.	.Outdated curriculum	.Outdated curriculum
Leather & Leather Goods	4	.Shortage of institution	.Training institutes not aware about industry needs	.Outdated curriculum
Information Technology	4	.Shortage of quality institutes	.The quality of teachers is not satisfactory.	.Industry relevant subject matters absent in the curriculum .Lack of resources of the institutes

To summarize, people with vocational/technical skills are in short supply. There is a skills mismatch. Equally, quality and relevance of training seem to be unsatisfactory primarily due to low capacity utilization of the training institutes and lack of linkages of training to the labour market. Key challenges are: (i) lack of relevance – from the labour demand perspective, employers expressed concern about the quality of graduates and the lack of linkages of training to the labour market as a key reason for the poor outcomes; (ii) institutional issues and linkages to market needs – at the institutional level, there are insufficient links between TVET institutions and employers; (iii) system management – concerns exist about the management of the system both at the policy level and institutional level; and (iv) on-the-job training – firms are under investing in worker skills (cf. Ahmed, 2006).

The management of training institutions deserves close scrutiny. Although BMET seems to be progressing in decentralization, the overly centralized system of the DTE does not allow its principals to manage. They do not have authority to decide on key areas necessary for effective functioning of their institutions, e.g., hiring of teachers, discontinuing low-demand programmes, and offering market-demanded programmes. With clear guidelines and transparent procedures, heads of institutions should be able to select their teachers for approved posts and have the authority to reward or penalize depending on performance. They should also be allowed to hire on a part-time basis. The authority to close down courses in trade areas with low market demand so that the resources can be channeled to the more promising areas should also be provided. With respect to short courses, principals should even have greater authority to be able to respond quickly to market needs. However, while autonomy is certainly needed if management is to be accountable for performance, management's readiness to assume greater responsibility must be considered. Thus, a continuing management development programme to build management capacity is needed.

Current Skill Gaps of the Workers

An assessment of the availability of skills in a workforce typically involves consideration of skill gaps and skill shortages. Skill shortages involve the prospect of the traditional supply source drying up through a shake out in the study industrial sub-sectors with a resulting gap to fill for the future, or a lack of trained workers in a particular occupation. Skills gaps in the present context means the skills or attributes which are unavailable to an industry due to inadequate training, poor skill levels of existing workers or greater opportunities available in other industrial sectors (cf. LSC, 2004; Pritchard, 2002).

An understanding of current skill gaps is important in its own right in order to better plan training initiatives. To this end, it is useful to make the distinction between two types of skill sets. Those skills which are generic and therefore tend to apply across a range of different occupational groups, and those which are vocational, in that they are specific skills needed to do the work within an occupation. Generic skills encompass communication, team working, problem solving and associated skills. Vocational skills tend to encompass occupation or job specific skills. In addition to these, many employers look for particular individual characteristics in recruits, such as motivation, judgement, leadership skills and so on. Many of the latter are thought to be innate skills or personal attributes.

The survey of enterprises indicates that there are a number of skills gaps in workers from different occupations. Most important amongst them is a lack of basic knowledge, lack of industrial behaviour and technical job skill. These skill gaps are most prominent in IT, food manufacturing, transport equipment and textiles (Table-10.15). Among other skill gaps, while lack of accuracy is most predominant in food manufacturing, lack of knowledge of machine maintenance is dominant in leather and textiles.

The occupations in which these skill gaps exist are presented in Table-10.16. In all sub-sectors other than IT and ceramics there is a wide range of occupations in which skill gaps exist. Although type of occupations across sub-sectors differs significantly, most of the skill gaps relate to production occupations which are crucial for productivity performance of the enterprises.

The survey enterprises recommend some potential trade areas for improving the supply of skilled TVET graduates. These trades by sectors are presented in Table-10.17. All these trades relate to shop floor production activities. This amounts to saying that there is virtually no dearth of skills in occupations other than production.

Table-10.15: Frequency Distribution of Occupations by Areas of Current Skill Gaps of the Workers

Sub-sector	N	Areas of Skill Gap in Different Occupations									Communication
		Basic Knowledge	Job Skill	Accuracy	Knowledge of Machine Maintenance	Industrial Behavior	Troubles Shooting	Precision	Manual Dexterity	Working speed	
Textiles	5	9	2	2	3	9	0	0	0	0	0
Pharmaceuticals	5	4	4	0	1	4	1	0	1	1	0
Food Manufacturing	5	9	7	6	2	7	0	1	1	0	0
Ceramics	4	5	0	1	2	4	0	0	1	0	0
Furniture	5	0	2	0	0	2	0	1	1	0	0
Transport Equipment	4	8	6	0	0	9	0	0	0	0	0
Leather & Leather Goods	4	2	2	1	4	0	0	2	0	0	0
Information Technology	4	9	6	0	0	9	0	0	0	0	1
Total Case	36	46	29	10	12	44	1	4	4	1	1

Table-10.16: Occupations of Current Skills Gaps

Sub- Sector	N	Occupations of Current Skills Gaps
Textile	5	a) Machine operator, b) Production operator, c) Market labour (semi-skilled), d) Quality Controller, e) Line Chief, f) Technician, g) Doffer, h)Mixer man, i) Lab boy, j)Wide man, k) Fitter, l) Helper, m) Production worker
Pharmaceutical	5	a) Tablet Operator b) Capsule Operator, c) Packaging worker, d) Ointment Operator, e) Junior production operator, f) Store keeper, g) Production operator, h) Pellet operator, i) Quality assurance worker, j) Health and safety assurance worker, k) Production Manager, l) Production Officer, m) Machine operator, n) General worker
Food Manufacturing	5	a) Grading worker, b)Beheading worker, c) Cold-storing worker d) Processing assistant., e) General worker, f) Cleaner, g) Production operator, h) Helper, i) Lab Assistant, j) Production Assistant, k) Production worker, l) Foreman m) Machine operator, n) Mixer man, o) Packaging worker, p) Oven man, q) Shrimp receiver,) Penning worker
Ceramics	4	a) Assistant Operator, b) Helper, c) General Worker, d) Machine Operator
Furniture	5	a) Machine Operator, b) Lacquer Operator, c) Carpenter, d) Designer, e) Sewing worker, f) Upholsterer, g) Welder, h) Polisher, i) Sawing operator, j) Veneer flush worker, k) Wood processor, l) Foam maker, m) Brass engraver
Transport Equipment	4	a) Machine operator, b) Semi-skilled worker, c) Electrician, d) Technician, e) Crane operator, f) Pipe fitter, g) Welder, h) Painter, i) Fabricator, j) Quality Controller
Leather and Leather Goods	4	a) Machine operator, b) Semi-skilled worker, c) Senior operator , d) Technician, e) Crust operator, f) Finishing operator, g) Store keeper, h) Cutting operator, i) Junior operator, j) Helper
Information Technology	4	a) Quality Assurance Engineer, b) Software Engineer, c) Mechanical Engineer, d) Web Developer, e) Desktop Publisher

Table-10.17: Potential Areas for Improving the Supply of Skilled TVET Graduates

Sub- sector	N	Occupation/ Trade	Enterprises Reporting	
			Number	%
Textile	5	(i) Machine Operator	1	20.00
		(ii) Production Operator	1	20.00
		(iii) Technician	2	40.00
		(iv) Supervisor	1	20.00
		(v) Mechanical Engineer	2	40.00
		(vi) Electrical Engineer	3	60.00
		(vii) Occupational Safety and Health Operator	1	20.00

Pharmaceutical	5	(i) Machine Operator	1	25.00
		(ii) Boiler Operator	1	25.00
		(iii) Production Operator	1	25.00
		(iv) Ointment Operator	2	50.00
		(v) Quality Assurance Operator	1	25.00
Food Manufacturing	5	(i) Grading Worker	2	40.00
		(ii) Production Worker	1	20.0
		(iii) Lab Assistant	1	20.00
		(iv) Processing Operator	2	40.00
		(v) Supervisor	2	40.00
		(vi) Beheading Worker	1	20.00
Ceramics	4	(i) Highly Skilled Worker	1	25.00
		(ii) Production Operator	1	25.00
		(iii) Technician	2	50.00
		(iv) Supervisor	1	25.00
Furniture	5	(i) Lacquer Painter	2	40.00
		(ii) Carpenter	3	60.00
		(iii) Machine Maintenance Operator	1	20.00
		(iv) Plastic Wood Treatment Worker	2	40.00
		(v) Polisher	1	20.00
		(vi) Sawing Worker	1	20.00
		(vii) Machine Operator	1	20.00
		(viii) Designer	1	20.00
		(ix) Wood Treatment Worker	1	20.00
Transport Equipment	4	(i) Pipe Fitters	2	50.00
		(ii) Electrician	1	25.00
		(iii) Foreman	1	25.00
		(iv) Welder	1	25.00
		(v) Painter	1	25.00
		(vi) Technician	1	25.00
		(vii) Fitter	1	25.00
		(viii) Quality Controller	1	25.00
		(ix) Machine Operator	2	50.00
Leather and Leather Goods	4	(i) Machine Operator	1	25.00
		(ii) Cutting Operator	2	50.00
		(iii) Technician	2	50.00
		(iv) General Worker	1	25.00
Information Technology	4	(i) Computer System Analyst	1	25.00
		(ii) Software Developer	1	25.00
		(iii) Web Developer	1	25.00
		(iv) Information Security Analyst	1	25.00

Chapter 11

Assessment of the Future Demand for Skilled and Educated Workforce of the Industrial Sub-Sectors

With fairly stable skill sets, and reasonable scenarios about the economy, time series analyses of historical skill demand could be used to predict the numbers for each category, and the demand could then be calculated. However, industrial skills do not represent a stable skill set and, historically, have been very difficult to predict due especially to rapid changes in technology. There are large fluctuations in the rate of growth of demand for industrial skills, making prediction based on historical information problematic. More importantly, due to time and budget constraints this method could not be used for our present exercise. Instead, we have listened to the employers and consulted HRD personnel of the survey enterprises in order to derive estimates for the various occupational components of skill demand for the next 2-3 years. Information gleaned from interviews and focus groups with industry representatives and other knowledgeable persons have given good reason to work out future skill demand¹³ in different occupations.

11.1 Factors Affecting Future Demand for Skills

11.1.1 Labour Turnover

Labour turnover constitutes an important factor contributing to both current and future demand for skilled workers. This demand, however, is associated with replacement demand. Labour turnover is quite significant in the survey enterprises ranging from 6.2% in furniture to 17% in food manufacturing (Table-11.1). Leakage of skills through labour turnover constitutes a barrier to investment in training. Because exit of trained workers due to retirements, deaths, change of occupation, sickness, going overseas, etc. results in externalities from inability to recoup training investments.

When accounting for the costs (both real costs, such as time taken to select and recruit a replacement, and also opportunity costs, such as lost productivity), the cost of employee turnover becomes significant for the companies. There are both direct and indirect costs. Direct cost relate to the leaving costs, replacement costs and transitions costs, while indirect costs relate to the loss of production, reduced performance levels, unnecessary overtime and low morale.

¹³ At the level of the firms, the future demand for skills are anticipated to equate existing skill gaps in the firm + new demand due to expansion of the firm due to influence of the market or other factors + replacement demand (due to retirement of some skilled hands in the firm) + demand created due to technological change introduced by the firm. On the basis of estimates for individual firms in each surveyed sub-sector, it is possible to make sectoral projections for skill demand.

11.1.2 Capacity Expansion

The demand for skills arising out the expansion of production capacity of the enterprises is an expansion demand emanating from growth. Capacity expansion with a given technical know-how will require expansion of kindred skill sets existing in the enterprises. Enterprise survey finds that 30 (83.33%) out of 36 survey enterprises are planning to expand their production capacity within the next 2-3 years (Table-11.1). This will greatly contribute to an increase in their future demand for skilled workers. For all practical purposes, wide skill base of the workforce is a critical component of the expansion of physical capital and its productive capacity.

11.1.3 New Technology

According to the enterprise survey, 69.44% of the enterprises are expecting to introduce new technology in their production processes. This will result in combining existing skills with required new skills through the interaction of new/advanced technology with each component of skill in order to see the enterprises' relative use of high-ability workers and high-experience workers. The comprehensive measures of skill reveal that advanced technology interacts with each component of skill quite differently: firms that use advanced technology are more likely to use high-ability workers, but less likely to use high-experience workers.

II.1.4 Better Product Quality

Product quality matters greatly in the competitiveness of the enterprises. Largest proportion of the survey enterprises (91.67%) are planning to improve the quality of their products. This will require improvement in the skills of the existing workforce. Employability skills in the industry will include a mix of core (vocational/technical) and non-core (generic) skills. Generic skills may be acquired from the marketplace but, more realistically, the industry is likely to focus on securing highly qualified people to ensure that core accreditation/specific quality assurance certifications are in place and take an *ad hoc* approach to other skills development needs.

The key issue is to what extent the existing skills translate into fulfilling future skill requirements. To address this issue, two components of the future flow of skills need to be considered: The first is the role of the existing stock of skills in providing future skills and the second is the degree to which the enterprise can provide new skills to meet the net demand requirement in the future. Significant changes in the stock of skills are likely to be associated with dominant occupations within the sub-sector, while a dependency on the current stock of skills to feed future skills supply needs raises some issues especially around retraining/upskilling and the relevance/compatibility of existing skills to the new skill needs.

Table-11.1: Factors Contributing to Future Demand for Skilled Workers and Occupations in Future Demand

Sub Sector	N	Factors Contributing to Future Demand for Skilled Workers							Occupations/Trades of Skilled Workers in Future Demand	
		Annual Exit (%)	Capacity Expansion		New Technology		Better Product Quality			
			Yes	No	Yes	No	Yes	No		
Textiles	5	7.14	3	2	1	4	4	1	Doffer, Production operator, Mixer man, Maintenance worker, Cutting man, Technicians, Electricians, etc.	
Pharmaceuticals	5	6.9	3	2	3	2	5	0	Pharmacist, Chemist, Machine maintenance operator, Pellet worker, Production (chepha) worker, Quality assistant worker, etc.	
Food Manufacturing	5	17.0	5	0	4	1	5	0	Grading man, Processing worker, Machine maintenance operator, Technicians, Production worker, etc.	
Ceramics	4	3.14	4	0	2	2	3	0	Mechanical engineer, Technicians, Production operator, etc.	
Furniture	5	6.2	5	0	5	0	5	0	Lakers painters, Carpenter, Plastic furniture operator, Upholsterer, etc.	
Transport Equipment	4	9.75	4	0	4	0	4	0	Welder, Pipe fitters, Marine machinist, Ship fabricator, etc.	
Leather & Leather Goods	4	9.1	2	2	2	3	3	0	Sewing worker, Leather cutting worker, Machine maintenance operator, etc.	
Information Technology	4	6.32	4	0	4	0	4	0	Web developer, Desktop publisher, Software engineer, etc.	
Total	36	8.32	30	6	25	12	33	1		

11.2 Assessment of Future Demand for Skilled and Educated Workforce

Available evidence suggests that the study sub-sectors would continue to grow, aim to improve their competitiveness and to promote exports. Naturally, future demand for skilled and educated workforce of these sub-sectors will continue to grow. As reported by the survey enterprises, the future demand for skills will consist in the occupations/trades detailed in Table-11.1. As expected, skills in all the occupations/trades in future demand relate to respective production activities of the sub-sectors.

11.3 Areas of Interventions to Improve the Supply of Required Skill Competencies in the Sub-Sectors

As evident, there is supply of some skills which does not match market demand. Therefore, the areas for interventions to make the skill supply responsive to skill demand will encompass filling existing skill gaps and shortages as well as to create new skills by recasting existing training system. Table-11.2 presents how the survey enterprises want to meet their future demand for skills. About one-third of the enterprises indicate labour market as the first choice of skill replenishment. Next in importance comes TVET system, training of the unskilled youths and migrant labour. All this implies that there is a crucial need for improving the labour market flexibility and the TVET system.

Table-11.2: How the Company Wants to Meet their Skilled Labour Demand in Order of Importance

Sub- Sector	N	Labour Market					TVET					Training Unskilled Youth					Existing Employees through Upgrading					Migrant Worker				
		1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5	1	2	3	4	5
Textiles	5	2	0	0	0	0	2	0	2	0	0	0	3	2	0	0	0	1	0	1	0	1	1	1	0	1
Pharmaceuticals	5	2	0	0	0	0	1	2	2	0	0	0	1	2	2	0	0	1	2	1	0	2	1	0	0	0
Food Manufacturing	5	1	1	0	1	0	1	1	1	0	0	1	2	2	0	0	1	0	2	0	1	1	1	0	3	0
Ceramics	4	0	2	0	0	0	2	0	2	0	0	0	1	0	1	0	0	1	0	1	1	2	0	3	0	0
Furniture	5	0	1	1	0	0	3	1	0	0	0	1	2	0	0	0	1	0	1	2	0	0	1	1	0	0
Transport Equipment	4	1	1	0	2	0	0	2	2	0	0	3	0	0	1	0	0	1	1	1	0	0	0	2	0	1
Leather & Leather Goods	4	1	1	0	0	1	0	0	1	0	0	2	2	0	0	0	0	1	0	0	0	1	0	1	1	0
Information	4	3	1	0	0	0	0	0	1	0	0	0	2	0	1	0	1	1	2	0	0	0	0	0	2	1

Technology																										
Total	36	10	7	1	3	1	9	6	11	0	0	7	13	6	5	0	3	6	8	6	2	7	4	8	6	3

Chapter 12

Recommendations

12.1 Skill-Intensive Sub-Sectors with High Potential for Growth, Competitiveness and Export Capabilities

Of all the eight industrial sub-sectors the most skill-intensive are IT (70.62%), ceramics (70.58%), transport equipment (65.87%) and furniture (64.13%). As noted earlier as well as in the Appendix-B, these sectors have high potential for growth, competitiveness and export capabilities. Pilot initiatives for skill development programmes may, therefore, be undertaken in these sub-sectors with a focus on the priority occupations/trades for skill development as detailed in Table-12.1.

Table-12.1: Priority Occupations/Trades for Skill Development

Sub-Sector	Priority Occupations/Trades for Skill Development
Information Technology	Web developer, Desktop publisher, Software engineer, etc.
Ceramics	Mechanical engineer, Technicians, Production operator, etc.
Transport Equipment	Welder, Pipe fitter, Marine machinist, Ship fabricator, etc.
Furniture	Laquer painter, Carpenter, Plastic furniture operator, Upholsterer, etc.

Using skill intensity only as the criterion for ranking the industrial sub-sectors, information technology appears to be the first priority sector followed by ceramics, transport equipment and furniture in that order. However, the role of these sectors in employment generation and their market size can by no means be underrated. So we can use point method to assign scores to each of the three criteria and then calculate the weighted average of the three. When we assign equal weights to the three scores, textiles sector ranks first (Table-12.2). Apparently, employment and market size weigh most for this sub-sector. The largest employment generating sector of furniture ranks second. Transport equipment ranks third followed by pharmaceuticals sector. The positions of these top four sub-sectors do not change even if we assign 50% weight to skill intensity, 30% to employment and 20% to market size. Comparing the two methods of ranking by only skill intensity and by weighted ranking of skill intensity, employment and market size, we find that furniture and transport equipment appear in the first four sub-sectors. Hence, these two sub-sectors can be recommended to be prioritized for skill development initiatives and training programmes.

Table-12.2: Weighted Priority Industrial Sub-Sectors for Skill Development and Training

Sub-Sector	Skill Intensity (% of total skilled workers)	Rank using skill intensity	Point (1)	Employment Size (000)	Point (2)	Market Size (Million US\$)	Point (3)	Weighted Average = $(1/3)*\text{Point}(1) + (1/3)*\text{Point}(2) + (1/3)*\text{Point}(3)$	Rank using equal weights (1/3, 1/3, 1/3)	Weighted Average = $(1/2)*\text{Point}(1) + (3/10)*\text{Point}(2) + (2/10)*\text{Point}(3)$	Rank using varying weights (1/2, 3/10, 2/10)
Textiles	58.72	6	83.1	1500	75.0	1500	100.0	86.0	1	84.1	1
Pharmaceuticals	61.09	5	86.5	240	12.0	500	33.3	43.9	4	53.5	4
Food Manufacturing	55.67	7	78.8	50	2.5	50	3.3	28.2	8	40.8	7
Ceramics	70.58	2	99.9	15	0.8	4.5	0.3	33.7	6	50.3	6
Furniture	64.13	4	90.8	2000	100.0	300	20.0	70.3	2	79.4	2
Transport Equipment	65.87	3	93.3	240	12.0	432	28.8	44.7	3	56.0	3
Leather & Leather Goods	45.94	8	65.1	150	7.5	280	18.7	30.4	7	38.5	8
Information Technology	70.62	1	100.0	12	0.6	200	13.3	38.0	5	52.8	5

Source: Figures for employment and market size of all the sub-sectors other than shipbuilding component of transport equipment are estimates made by Bangladesh Employers Federation. These figures for shipbuilding were provided by Western Marine Group.

Note: Method of Weighting:

Step 1: The values of each variable are normalized to a scale from 0 to 100. The maximum value for each variable is set as 100 and other values are converted proportionately. These scores are reported in the columns Point (1), Point (2) and Point (3) for skill intensity, employment size and market size respectively.

Step 2: Using equal weight for the three different scores in 0 to 100 scale, the weighted average score is reported in the column showing Weighted Average = $(1/3)*\text{Point}(1) + (1/3)*\text{Point}(2) + (1/3)*\text{Point}(3)$.

Step 3: The corresponding rank on the basis of this weighted average score is then reported in the column next to it.

12.2 Strengthening the Sub-Sectors through Improved Skills Development Policies and Practices

Making Training Relevant to Market Needs: Increasing the relevance of training can be achieved through (i) involving the private sector in institutional management; and (ii) allowing public and publicly financed institutions greater autonomy.

- **Improved Linkages between TVET and Enterprises**
 - Ensure that employers' and workers' representatives participate in the national TVET policy development committees; and
 - Ensure that employers' representatives are appointed to the skills standards drafting committees and qualifications development committees.
- **Improved Access and Equity in TVET:** This describes the state where opportunities are available and affordable for all clients. Relevant timely information on training opportunities needs to be made available for prospective beneficiaries.
- **Improved Assessment and Certification:** Professional accreditation plays a key role in the maintenance of quality and standards of skill. There is increased number of TVET graduates with verified/validated competence to perform a particular skill according to quality standards defined by the industry. The registration of certified TVET graduates needs to be readily available to prospective employers for employment.
- **Enhanced Employability of TVET Graduates:** This is the environment where TVET graduates have improved access to employment opportunities. Graduates will also have improved prospects for entrepreneurial and self-employment endeavours.

In order to effectively rise to the challenges of sub-sectoral skill demand, it is recommended that sub-sector working committees (SWCs) need to be established. SWCs will identify occupational areas where more personnel are needed, and articulate employer and industry requirements. Training institutions that will be eligible for resources will have an advisory council with industry and employer members.

Competency-based training (CBT) provides several advantages over time-based qualifications, but its requirements must be analyzed and addressed including development, teacher training, equipment, and awareness. Industry representative experts should form part of the SWCs that will develop the competency standards. In-service teacher training will need to address the delivery of CBT courses, and selected training institutions need to be provided with adequate training equipment. Simultaneously, public awareness campaigns on CBT need to be put in place.

Use of training funds can spur reallocation of resources to high priority activities and clientele, and stimulate competition between public and private training providers. It is recommended that the skills that are immediately needed by the labour market and the relevant training programmes be identified, and the training package delivered.

Labour market analysis and tracer studies are important for proper direction and feedback to the training systems. Training programmes to be offered need to be based on the requirements of the respective focus industries. After some training programmes have been conducted, tracer studies of the trainees need to be commissioned. The capacity of the personnel of the DTE and BTEB needs to be strengthened to analyze labour market demand.

Where reform of training systems is undertaken, the establishment of national qualification frameworks will facilitate labour mobility and more efficient use of training resources. There is a need to complement development of the vocational qualifications framework and to support CBT and develop CBT curricula.

Strategic Directions

It is recommended that the following strategic directions be followed by the TVET reform initiatives in Bangladesh:

(i) **Private Sector-Led and Market-Driven TVET:** Strengthened linkages between TVET providers and industry need to be promoted in order to ensure the active participation of private enterprises in the development and provision of quality technical education and skills development opportunities.

(ii) **Pro-Active Job-Skills Matching (SEEK-FIND-TRAIN):** Enhancement of matching TVET outputs with available jobs need to be addressed through this strategy with the implementation of the following three components:

- (a) SEEK local business opportunities and jobs through domestic and international labour market intelligence to pinpoint the exact requirements of the job market;
- (b) FIND the right people fit for the jobs; and
- (c) TRAIN the right people for the available jobs using quality standards developed in consultations with the industry. Programmes and support services need to be provided such that the TVET system effectively contributes to putting people to work and keeping them wage employed or self-employed.

By and large, all training programmes need to be guided by the job-skill matching paradigm, both in terms of quantity and quality set by industries, especially in critical occupations and areas where there are high demand.

(iii) **Life Long Learning Mechanism and Articulation:** This mechanism calls for the institutionalization of a ladderized interface between TVET and higher education because this will promote TVET as a pathway to a lot of opportunities. This will facilitate transition and progression between TVET and higher education and *vice versa*. This will also afford upward career mobility

(iv) **Expanding Scholarships and other Incentive Support Services:** Various scholarships and other financial assistance programmes need to be implemented to broaden access to education and training opportunities. These should be provided only to deserving students, faculty members and trainers.

(v) Competency-based TVET: This would necessitate an entirely new learning environment where the trainers will become facilitators of learning. This strategy should adhere to the following principles: multiple entry/exit; modular and self-paced; learning and assessment of learners according to actual work to be performed based on industry standards; recognition of prior learning; on- and off-the-job experience; and should provide national recognition/ accreditation for acquired competencies.

(vi) Enhancing Quality Assurance Mechanisms: This would require the utilization of quality systems, procedures and processes of partners towards producing quality products and services. Continuous development and review of competency standards and assessment and certification processes with the active involvement of the private sector registration and certification of TVET programmes need to be pursued particularly by the industry to ensure adherence to defined norms and standards.

(vii) Entrepreneurship in TVET: TVET should develop the entrepreneurial acumen of the workers to make them more aggressive and hardworking. In a similar vein, this calls for enhancing their awareness and potentials to tap available resources.

While getting a job is crucial, it is equally important to have advancement in the career. There are several views on how to progress in working life: work sincerely, develop specialisation, and do job hopping and many more. However, the critical factor is that one needs to establish that one has the qualities and attributes that could bring benefits to the employer. In other words, one has to develop job market value.

This requires updating knowledge and skill, right aptitude to work, personal ability and cohesively harnessing them to meet the company goal. One needs to internalise the skill concepts and practices in real life situation. Also, one has to realise that in many instances blind application of theory may not work due to unique features of socio-economic, socio-political and legal conditions together with internal working environment of the company. One has to follow the rules of the game and adapt to suit the changing tastes of time.

References

1. ADB (2008): Asian Development Bank, Proposed Loan, People's Republic of Bangladesh: Skills Development Project, Report and Recommendation of the President to the Board of Directors, Project Number: 39408, May 2008.
2. ADB (2007): Asian Development Bank, Skills Development Project, Draft Final Report, ADB PPTA 4799 BAN, 1 June 2007, PINZ Education ... Global Specialists.
3. Ahmed (2006): Shaikh Ahmed, Vocational Education and Training System in Bangladesh: An Assessment, WBI and SAR: Regional Conference on Education, Training and Knowledge Economy in South Asia, New Delhi, 14-15 September 2006.
4. Ahmed *et al* (2004): M.U. Ahmed, B.H. Khondker and A. Razzaque, Improving Enterprise Competitiveness and Decent Work: A Study on Bangladesh, Study prepared for ILO, Bangladesh.
5. Ahmed *et al* (2008): N. Ahmed, M. Yunus and H.R. Bhuyan, Promoting Employment – Intensive Growth in Bangladesh. Policy Analysis of the Manufacturing and Service sectors, BIDS-ILO Study, Dhaka.
6. BBS (Various Years): Bangladesh Bureau of Statistics (Various years): Report of Labour Force Survey.
7. BBS (Various Years): Bangladesh Bureau of Statistics (Various years): Reports of Census of Manufacturing Industries.
8. Bosworth & Collins (2003): B. Bosworth and S. Collins, The Empirics of Growth: An Update (Mimeo).
9. Bosworth *et al* (2006): B. Bosworth, S. Collins and A. Virmani, Sources of Growth in the Indian Economy. Paper prepared for the Indian Policy Forum, held in New Delhi, July 31-August 1, 2006.
10. ILO (1988): International Labour Office, Training of Technicians for the Mechatronics Age, Asian and Pacific Skill Development Programme, International Labour Office, Islamabad, pp.3-22.
11. ILO (2008): TVET Reform in Bangladesh, Project document.
12. Islam (2004): A.F.M.M. Islam, New Growth Areas and Employment: The Bangladesh Perspective, ILO.
13. Joshi (2005): G. Joshi, Competitiveness and growth areas in Bangladesh – Prospects for decent work, ILO, New Delhi.
14. Koike & Inoki (1990): Kazuo Koike and Takenori Inoki (eds.), Skill Formation in Japan and Southeast Asia, University of Tokyo Press, Tokyo, 1990, pp.3-31.

15. LSC (2004): Learning and Skills Council, Strategic Area Review, Employers' Skills Needs Analysis, The Education Sector, Nottinghamshire, 2004.
16. Ministry of Industry, Government of Bangladesh (2005): Industrial Policy 2005.
17. PINZ Global Education Specialist (2007): ADB PPTA 4799 Ban, Skills Development Project.
18. Pritchard (2002): John Pritchard, An assessment of skill needs in financial services and accountancy, Department for Education and Skills, Document no. TD/TNC 72.151, Nottingham, December 2002.
19. Rahman *et al* (2008): M. Rahman, W.B. Shadat and S. Raihan, Impact of Trade Liberalization on Employment in Bangladesh, Centre for Policy Dialogue and ILO, Geneva.
20. Rahman (2005): R.I. Rahman, Performance of the Labour Market in Bangladesh: Recent Changes and Policy Implications, Background paper for the World Bank.
21. Rahman (2007): R.I. Rahman, Labour Market in Bangladesh, Changes, Inequities and Challenges, Research Mongraph 21, BIDS.
22. Rahman & Islam (2006): R.I. Rahman. and K.M.N. Islam, Bangladesh: Linkages among Economic Growth, Employment and Poverty in R. Islam (ed.) 'Fighting Poverty. The Development – Employment Link'. Lynne-Rienner Publishers, Boulder: London.
23. Sahota *et al* (1991): G.S. Sahota, M. Huq, N. Hossain and K.K. Sanyal, South Asian Development Model and Productivity in Bangladesh, in The Bangladesh Development Studies, Vol. XIX, No. 1 & 2.
24. The World Bank (2007): Bangladesh: Growth and Export Competitiveness...

Appendix-A
List of Persons, Industrial Enterprises and Associations Interviewed

1. Textile Sub-Sector

Sl. No.	Manufacturer	Contact Person
1	Hanif Spinning Mills Ltd	Mohammed Hanif, Managing Director
2	Karim Spinning Mills Ltd	Shafiqul Islam, Managing Director
3	Badsha Textiles Ltd	Md. Badsha Mia, Managing Director
4	Padma PolyCotton Knit Fabrics Ltd	Akhter Us Samad, Manager (Compliance)
5	Noman Group of Industries	Mr. Nurul Islam, Managing Director Md. Nurul Afsar, Company Secretary

2. Pharmaceutical Sub-Sector

Sl. No.	Manufacturer	Contact Person
1	Beximco Pharmaceuticals Ltd	Mr. Nazmul Hassan, Chief Executive Officer
2	Renata Limited	Mr. Sayed S. Kaiser Kabir, Managing Director
3	Eskayef Bangladesh Ltd.	Mr. A M Faruque, Managing Director
4	ACI Ltd.	Mr. M Mohibuz Zaman, Chief Operating Officer
5	SQUARE Pharmaceuticals Ltd.	Md. Faisal Iqbal, Executive, Human Resources

3. Food Manufacturing Sub-Sector

Sl. No.	Manufacturer	Contact Person
1	ARK Sea Foods Ltd	Md. Aminullah, Managing Director
2	Amam Sea Food Industries Ltd	S. Humayun Kabir, Managing Director
3	Al Amin Biscuit & Bread Industries Ltd.	Mr. Zahir Uddin Mahmud Khan General Manager (Marketing)
4	Banoful & Co. Ltd.	M.A. Motaleb, Managing Director
5	Southfield Fisheries Ltd.	Khondoker Aynul Islam, Managing Director Badol Chaudury, Production Manager

4. Ceramics Sub-Sector

Sl. No.	Manufacturer	Contact Person
1.	Bengal Fine Ceramics Ltd.	Mr. Rashed Maksud Khan, Managing Director
2.	Fu-wang Ceramic Industry Ltd.	Mr. S.M Mahbub Alam, Director
3.	Madhumati Ceramics Ltd.	Mr. Golam Sabur, Managing Director
4.	Farr Ceramics	Mr. Tanvirul Islam, Senior Production Manager

5. Furniture Sub-Sector

Sl. No.	Manufacturer	Contact Person
1	Aktar Furnitures Ltd	K.M. Aktaruzzaman, Managing Director
2	Hatil Complex Ltd.	Selim H. Rahman
3	Unique Furnitures Ltd.	Syed A.S.M. Nuruddin
4	Brothers Furniture Ltd.	Md. Ilyas Sarkar
5	OTOBI (Established: 1975) OTOBI Centre	Ms. Lily Adhikary, Production Officer

6. Transport Equipment Sub-Sector

Sl. No.	Manufacturer	Contact Person
1.	Ananda Shipyard	Dr. Abdullahel Bari, Chairman
2.	Western Marine Group	Sakhawat Hossain, Managing Director Sajid Hussain, Executive Director
3.	Transworld Bicycle Co., Meghna Bangladesh Ltd	Mizanur Rahman, Managing Director Major (Retd) M.A. Halim Khan, Director Md. Lutfur Rahman (Badal), AGM
4.	North Bengal Cycle Industries Ltd.	Mr. Fazle R.M. Hasan, Managing Director Abdul Matin, DGM Osman, AGM

7. Leather & Leather Goods Sub-Sector

Sl. No.	Manufacturer	Contact Person
1	Apex Adelchi Footwear Ltd	Mominul Ahsan, Head of Human Resources
2	Picard Bangladesh Ltd	Mustafizur Rahman, Manager (Admin)
3	M/S Apex Tannery Ltd	M.A. Majed, Executive Director

4	M/S Vulua Tannery Ltd	Md. Abdul Awal, Chairman
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8. IT Sub-Sector

Sl. No.	IT Enterprises	Contact Person
1.	BJIT Limited	AKM Ahmedul Islam, Chief Executive Officer
2.	GraphicPeople	Imtiaz Elahi, Managing Director Nazim Farhan Chowdhury, Director
3.	Southtech Limited	Syed Mammun Quader, Managing Director
4.	Bdjobs.com Ltd.	Fahim Mashroor, Chief Executive Officer
5.	Technohaven Co Ltd	Habibullah N Karim, Managing Director

Industrial Associations

Industrial Association	Contact Person
Bangladesh Textile Mills Association (BTMA)	G.K.M. Towfique Hassan, Secretary-General
Bangladesh Association of Pharmaceutical Industries (BAPI)	
Bangladesh Agro-Processors Association	K. Muzammil Huq
Bangladesh Frozen Food Exporters Association (BFEEA)	Abul Bashar, Director
Bangladesh Association of Pharmaceutical Industries (BAPI)	Mr. Md. Jinnat Parvez
Furniture Makers Association	Mr. K.M. Akhtaruzzaman, Chairman
Bicycle Manufacturers Association	Mr. Harun Khan, General Secretary
Ananda Shipyard	Dr. Abdullahel Bari, Chairman
Bangladesh Bi-Cycle Manufacturers and Exporters Association	Halim Khan
Bangladesh Ceramic Ware Manufacturers Association (BCWMA)	Mr. Hassan Chowdhury, General Secretary
Bangladesh Finished Leather, Leather Goods and Footwear Exporters' Association (BFLLEA)	Alhaj Rezaul Karim, Chairman M.A. Awal, Sr. Vice-Chairman S.A.M.M. Nuruddin, Vice-Chairman

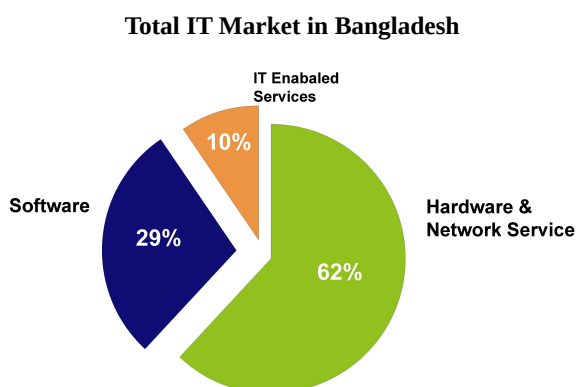
Appendix-B

Profile of Four Selected Sub-Sectors for Policy Interventions

1. Information Technology (IT)

Current Stage of Bangladesh Software and IT Industry

Though the current size of Bangladesh IT industry and software/ITES industry in particular is still very small compared to the overall economy and the size of population. Over the last few years the industry has grown considerably and is expected to grow at that rate for quite some time. It is estimated that during the last five years the annual average growth rate of software and ITES industry has been over 40%. This growth has been driven by good export trends in recent years as well as the growing IT automation demand in domestic market (local demand has been led by large automation projects by telecom, banking and export oriented garments/textile industry). Currently, there are over 400 registered software and ITES companies in the country employing over 12,000 ICT professionals. Software and ITES account for around 39% of the total IT market (excluding telecom) estimated to be over US\$ 300 million.



Source: BASIS survey

Current International Market and its Potential

Over 100 among the 400 software/ITES companies in the country are exporting to over 30 countries worldwide. Though a majority of the companies are exporting to North American Market (mainly USA), during the recent times there has been encouraging performance by a good number of companies in European and East Asian (mainly Japan) market. Among the hundred export focused companies, at least 30 companies have been set up either as joint venture (between foreign and local entrepreneur) or as offshore development centre (ODC) with hundred percent foreign investment. Most of these joint venture/ODCs have actually been set up during the last couple of years. During the last five years, the average export growth rate of software and ITES service has been 61.2 %.

Export of Software and ITES from Bangladesh during the Last 5 years (Figures in Million US Dollar)

	FY 2003	FY 2004	FY 2005	FY 2006	FY 2007
Export Amount	4.2	7.19	12.68	27.01	26.08

Source: Export Promotion Bureau

Major countries where software and ITES companies in Bangladesh export to are the following:

Countries	Number of Exporting Software/ITES Companies
USA	70+
Denmark	20+
UK	10+
Japan	10+
Australia	10+
Finland	8
Switzerland	5
Canada	6
Germany	8
Norway	5
Sweden	3
South Africa	4
Thailand	4
Middle East (UAE, Saudi Arabia, Bahrain)	10+

Source: BASIS Survey

To meet the high quality standard of offshore jobs and to comply with the expectation of overseas clients, the companies in Bangladesh are rightly focusing on putting in place global standard practices and processes. Over twenty companies have already got ISO certification. A number of companies are in the process of acquitting CMMi certification and by 2008 at least six companies are going to get to Level 3 in CMMi.

- European Union has recently identified Bangladesh as one of the best 20 outsourcing countries for EU market.
- In 2006, Goldman Sachs Group has included it in a list of 11 developing countries that, according to its analysts, have the greatest potential to emulate the long-term economic success expected from China, India, Brazil and Russia.

Bangladesh Association of Software and Information Services (BASIS) is the national trade association representing software and IT services companies of Bangladesh. Formed in 1997, the association has been working with the vision of developing efficient and vibrant software and IT services industry in the country. Currently, BASIS has over 250 members including leading software and ITES companies which account for the lion's share of the total software and IT services revenue of the country. BASIS tries to pursue the following broad goals through its following regular programmes and activities:

- Market development, both local and international,
- Assistance to the member companies successfully penetrates the international market,
- Capacity building of the member firms so that they can be internationally competitive,
- Persuasion for business-friendly government policies for the industry, and
- Workforce/HR development for software and ITES industry.

Some of the important regular activities and programmes organized by BASIS in line with the above goals include organizing yearly IT mega exposition 'BASIS SoftExpo', facilitating participation of BASIS members in different international IT shows and events, arranging business linkage programmes for members with foreign clients/partners, policy advocacy in different related areas like taxation, infrastructure, financing facilities for the industry etc.

ICT Environment and ICT Capacity in Bangladesh

Bangladesh is a country of over 140 million people with a significant proportion of the population belonging to the young age group (16-35). Over 10 million professionals and migrant workers working all over the world are working outside the country. For a country to excel in a knowledge based service industry like software and ITES, the human strength is the cornerstone of Bangladesh ICT capacity. During recent years, considering the importance of availability of good quality of institutional capacity for training the human resources, both the government and private sector have invested in building the required education infrastructure for training in IT related programmes. Currently, there are over one hundred universities, colleges and institutes offering graduate/engineering degree (4-year programme) and post-graduate degrees. These are producing over 5,500 graduates/engineers every year in ICT subjects. Out of that number, around 2,500 are computer science graduates or software engineers. Apart from the universities/colleges/institutes offering graduate level programme in ICT, there are several hundred centres across the country offering shorter duration courses (two years/one year/six months diploma or certificate courses) in different IT skills. These centres play important roles in producing large numbers of IT workforce who are mainly employed in different ITES sectors (e.g. graphic design, DTP, engineering drawing, web design/publishing, network maintenance etc.)

Number of Universities (Public & Private) offering IT Programs : 60+
 Number of Colleges/Institutes offering Graduate/Engineering programme in IT: 40+
 Number of Institutes/Centres offering Diploma or vocational programmes in IT: 300+

Number of ICT Graduates/Engineers

	Total Number of Graduates/Engineers Available in the Country	Yearly Production of Graduates/Engineers
Computer Science Graduates/ Software Engineers	15,000	2,500
ICT Graduates/ ICT Related Engineers	40,000	5,500

Source: BASIS Survey

Number of ITES Workforce Available in the Country in Selected ITES Areas

Graphics (2D&3D) & Animation, Web Design	12,000+
New Media: Prepress DTP, Web Publishing	8,000+
CAD (Architecture, Mechanical, Construction)	5,000+

HR Development Activities for Development of the HR Pool by BASIS

In order to successfully cater to the growing outsourcing requirement of international clients from all over the world, the key issue for the software industry in any country is the availability of high quality software professionals at different stages (software engineers, project managers, technical leaders etc.). BASIS gives high importance to the HRD aspect of the industry. BASIS with the partnership of Academia and Government agencies has taken a strategic approach to address the issue in the best possible way. The objective of this approach is to make high quality software HR pool available in the country that can support the sustainable growth of the industry, particularly with respect to offshore software outsourcing jobs.

Three-tier approach by BASIS to ensure high quality HR available for the software outsourcing industry includes:

- IT Career Awareness Building with the objective of attracting higher number of young talents from across the country to ICT fields. This is targeted to increase the number of enrollment in different ICT subjects offered by the Universities and ICT institutes.
- Programmes targeted for fresh IT graduates to make them 'software industry ready'. These programmes have the objective of bridging the gap between the acquired skills of fresh IT graduates and expected skill in the real industry. Some of the programmes and initiatives that are currently coordinated by BASIS are:
 - (i) Working closely with the university and other IT institutes for academic curriculum update/modification according to recent industry needs;
 - (ii) Working with the universities and related government agencies for development of a common skill assessment framework of the fresh IT graduates;
 - (iii) Conducting focused skill enhancement programmes for the fresh graduates and 'entry level' software professionals working in the industry; and
 - (iv) Internship programmes participated by BASIS member companies and supported by Ministry of Science, Information and Communication Technology.
- Higher Excellence Programme for senior level software professionals of BASIS member companies. As a part of these programmes BASIS has been organizing series of training programmes (workshops, seminars etc.) conducted by local and international industry experts in areas like software project management, software architecture and design, testing and QA, CMMi etc. The main objective of these programmes are to orient the existing professionals with the most advanced global industry trends, standards and practices so that they can be introduced in the local companies with the goal of achieving excellence and becoming internationally competitive.

ICT infrastructure

One of the very important factors for the significant growth in the overall IT sector during the recent time has been the phenomenal investment (both from the government and private sector) in the telecom and related ICT infrastructure in the country over recent years. Bangladesh is currently hooked up with SEA-ME-WEA 4 submarine cable for international connectivity (with 10 Gb capacity- expandable to 80 Gb) through Internet (All the Internet Service Providers have VSAT backup for redundancy). Currently, all the major cities within the country are connected through high speed fiber optic backbone. All parts of the country are accessible through Internet provided by the 'last mile connectivity' through wireless (GPRS/Edge or Wi-Max technology). Thanks to over 100% yearly growth in mobile penetration during the last five years, the country has currently over 25 million mobile phone users (20% of the total population).

Government Policy support

The Government of Bangladesh provides good policy support for growth of software and ITES sector, particularly with a view to promoting the export of the services. In the recent National Export Policy (2006-9), the Government has declared software as one of the six 'high priority' export sectors of the economy. Some of the government policy supports for the industry include the following:

Tax Holiday: The corporate income of the software business has been kept completely tax free.

Investment and Financing Support: Government has recently allocated Tk.1000 million as equity financing support for the local software and ITES companies. The Export Promotion Bureau (EBP) also provides working capital loan to software exporting companies against export orders at a very concessional rate. To attract foreign investment in the sector, Government has allowed 100% ownership in the sector and full profit repatriation for the investors.

Low or Zero Tariff for Capital Goods/Computers for the Software Industry: Since 1996 Government has been allowing zero/low tariff for computers and other capital goods required for software industry.

ICT Internship: Government provides financial support (60% of the salary/allowance cost) for recruiting interns (fresh graduates) by any software companies. For this programme which started in 2005, Government has allocated budget for 1,000 interns every year.

ICT Park and ICT Incubator: Government has recently started a mega project for establishing a high tech park (IT Park) right outside the capital city. When completed, it is expected to provide world class facilities (available in any reputed IT park in other countries) to the local and foreign IT companies. Government is also providing incubation support to smaller companies by providing infrastructural facilities.

ICT in Bangladesh

ICT has been in use in Bangladesh since the 1960s, and increased with the formation of the Bangladesh Computer Council (BCC) in 1986. The 1997 recommendations on ICT development and the 2002 ICT policy were formulated. More recently, an e-government cell was created in the Chief Advisor's unit, and completed an e-government horizon scan last December.

The inescapable conclusion is that the relative lack of progress cannot be explained by a lack of focus or political priority. Instead, the explanation lies in the fact that government strategies in this area have had less impact because of weaknesses in the way they were delivered.

Weaknesses in delivery

Much of the strategic work by the government takes a broad and ambitious approach to the scope of ICT policy change. This makes the government to try to do everything at once, and, therefore, under-deliver. Second, there are unclear and uncoordinated governance structures and processes. There are many bodies involved in ICT governance, which creates confusion about where accountability lies. The third weakness is lack of effective cross-government programme management. As ICT is a cross-cutting area, it involves more than one agency for implementation. For this reason, a taskforce was established under the Prime Minister's Office in 2000, but it did not operate effectively. Relations between the taskforce and the Ministry of Science and ICT were unclear; the key staff involved in supporting the taskforce had other priorities which conflicted with this role; and the taskforce has met very infrequently. There is no standard programme management technique applied to ICT policy coordination: that is, clearly assigned responsibilities, measurable targets and delivery plans for projects, and programme-wide risk management and issue escalation. The fourth weakness has been the lack of skills and capabilities within the government. The final weakness is implementation approach, which has been focused on government delivery rather than facilitation and enabling of private and voluntary sector solutions. The successful expansion of the mobile telephony market is a good example of the impact that can be achieved when the government puts in place an enabling framework for the private sector to work within, but the government can be slow in letting the market innovate.

In 2002, the government adopted a National Policy on ICT. But the Ministry of Science and Information and Communication Technology (MOSICT) has not been able to achieve the goals set out for e-governance in the policy. Against that background, Spininnovation and DNet –together with an international partner, Gov3 Limited – have been appointed to develop a short-, medium- and long-term National ICT Action Plan or Roadmap for Bangladesh on the basis of the National ICT Policy 2002, that provides detailed action plans for the: (i) use of ICT in Bangladesh's development efforts, and (ii) development of Bangladesh's ICT sector.

Consequently, recommendations on the National ICT Roadmap for Bangladesh have been made to the government. There are five key work-streams in the roadmap:

Empowering citizens

One of the objectives under this project is to ensure that by 2011 all Bangladeshis will have access to ICT and the skills to use them. The ICT roadmap plans to deliver this by building a national partnership to establish tele-centres, which will be achieved using a combination of different business models. Another objective is to ensure that digital contents in Bangla are easily produced and uploaded. The ICT roadmap will deliver this through a new national strategy for e-Bangla.

Finally, with the objective of ensuring that, by 2013, all children will have access to ICT, the roadmap plans to see secondary schools having ICT labs with access to all the curriculum materials with proper teacher training and support.

Transforming public resources

To transform the government, there is a need to have e-readiness. There have to be citizen-centric e-services, and a high demand for them (through a rich mix of channels including mobile phones, web, kiosks and service centres). This will contribute to economic development, poverty reduction, and better and more transparent governance. Every ministry must develop and deliver plans for e-service investments.

A citizen-centric, multi-channel one-stop shop for government must be delivered that will ensure that the services prioritised for e-enablement are delivered in a way that is designed around user needs and achieve high levels of uptake and user satisfaction.

One way of delivering this is through operating in an integrated way across multiple channels, using Bangladesh's high level of mobile phone penetration and the national network of tele-centres being developed as a part of citizen-centric e-services.

Another important part of the work-stream is to develop a comprehensive e-government inter-operability framework, to be fully adopted by all ministries and their ICT suppliers, ensuring that e-services can be integrated efficiently and effectively around citizens' needs and that there is no waste or duplication in the government's ICT investments.

Broadening the ICT sector

The issues impeding the growth of the hardware and software sectors should be resolved to broaden the ICT sector. International ICT trade and investment campaign must be undertaken to develop a globally-recognised brand for Bangladesh as a centre for ICT investment, outsourcing and exports, which will help the Bangladesh ICT sector to increase its levels of exports, turnover and FDI by at least 50% each year between now and 2013.

Through a strong national brand and a highly effective international communications campaign developed and delivered in partnership between the government and industry, this could be a reality. To ensure that the growth of the ICT sector in Bangladesh is not constrained by lack of access to debt and equity financing, there has to be access to finance for the ICT sector.

Enabling the market

Legal barriers to e-commerce must be removed and the necessary business changes put in place in the public and private sectors to take advantage of the new opportunities. The ICT roadmap plans to deliver this by establishing a certified authority to oversee the provision of digital certificates enabled by the ICT Act 2006, and development of a partnership with the banks to establish the business and technical infrastructure needed to make e-commerce and e-government transactions a reality.

Leadership and governance

Accountability for delivering all aspects of the roadmap and associated elements must be clear to all stakeholders for successful delivery of the roadmap, and effective structures and processes must be in place. A full-time "chief digital advisor" reporting directly to the taskforce and the Chief Adviser, supported by a small ICT Roadmap Programme Management Office, should be there to strengthen the governance. Bangalore has become the second largest ICT city after the Silicon Valley, USA, and Salt Lake of Kolkata is following its footprint. What the government can do is to bring the roadmap under scrutiny. A panel of experts can be given the responsibility to analyse it and make recommendations.

Demand for computer specialists spearheads growth in labour force

The demand for computer specialists led the growth in the labour force during the 1990s, although almost all of it occurred in the latter half of the decade. By the end of 2000, this demand had slowed to a crawl, as the high-tech sector struggled on a number of fronts.

The census counted 406,700 persons in computer-related occupations in 2001, more than double the level in 1991. Although their share of the total labour force was 2.6% in 2001, they accounted for one-sixth of the labour force growth (17%) over the decade. These professions included **analysts, consultants, programmers, website developers, software writers. Almost three-quarters of this group were in occupations requiring a university education.**

The emergence of call centres increased the demand for customer service workers, whose number almost tripled to 164,770. They accounted for 7.5% of the growth in the labour force during the 1990s. The gains were most notable in Dhaka, where a relatively large amount of call centre employment is located. While some occupations were on the rise, others were on the wane, substantially in some cases. With the proliferation of word processing, accounting software and office automation, the demand for secretaries and accounting clerks declined. The census counted 271,100 secretaries, excluding legal and medical secretaries, 35% fewer than they were a decade earlier. Similarly, the number of accounting clerks declined by 31% to 178,200.

There has been a rising global confidence in Bangladesh and its IT Industry in the recent years. Goldman Sachs recognized Bangladesh as one of the Next Eleven (N-11) – a list of eleven countries having strong potential for becoming the world's largest economies along with BRICs (Brazil, Russia, India and China), with highly promising outlooks for investment and future growth. European Commission has recently included Bangladesh as one of the top IT outsourcing destinations in the world.

2. Ceramics

Growth in ceramic industry

Starting production in the 1980s to feed the local consumers, ceramic tableware industry has made a slow but steady progress to reach the foreign market. The sector exported ceramic goods worth US\$30 million in the FY 2006-07 and targeted US\$45 million in the current fiscal year. After consistent growth in the last ten years, the country is now in a good position to achieve the target. Quality of products has earned Bangladesh a niche market in the developed world and the recent trend shows that the market will grow further.

Inspired by increased overseas demand and local capacity expansion, Bangladeshi ceramic manufacturers eye an annual US\$100 million export earnings by 2008, a mammoth jump from the yearly income of US\$30 million. The export of tableware products has been witnessing over 6.0% annual growth for the last ten years carving a significant niche in US and European markets. With 56% accumulated export growth in the last ten years, exporters now hope to see a double-digit growth which will help the sector break US\$100 million target by 2008. As overseas demand is going up, local big players - Monno, Shinepukur and Bengal Fine – now completely focus on export market, channelling over 80% output into the international market.

But in spite of all export prospects, a persistent gas crisis in the last few months seems to deprive the sector of a smooth growth. The industry needs to run the kilns 24 hours a day but it cannot do so due to low gas pressure. However, Bangladesh ceramic industry, which produces tableware, tiles and sanitary ware, has been witnessing a steady growth in the last few years due to the use of cheap gas, which resulted in low production cost. This has prompted many foreign buyers to make increased orders to Bangladesh. There are over a dozen of ceramic factories in Bangladesh, which produce over 40,000 MT of ceramic products a year. Monno, Shinepukur, Bengal Fine, Standard, Peoples and National Ceramic are engaged in tableware while RAK, Fu Wang, China-Bangla and Mir are engaged in tiles and sanitary ware.

The companies have invested over Tk5 billion and more investments are in the offing with many companies planning to produce all the three ceramic categories. Ceramic products including stone tableware, porcelain tableware, bone China tableware, tiles and sanitary ware have a US\$20 billion world market of which Bangladesh's share is only 0.17%. Although Bangladesh ceramic industry has become highly successful in carving out a niche for itself in the market of Europe and North America despite tough competition globally, it is losing its domestic market to outsiders surprisingly due largely to government policies.

Industry sources claim that heavy duty levied on imported raw materials and comparatively lower duty on imported finished ceramic products is robbing the local ceramic industry of its growth in the local market. The size of the local ceramic tableware market has been estimated at about Taka 3 billion of which local manufacturers' share accounts for only Taka 500 million.

Industry sources, however, claim that with policy support they can very well meet the entire demand locally saving the foreign exchange spent on the import of the item. The local ceramic industry has developed over the last two decades and has now emerged as one of the finest ceramic producing sectors in the world. According to official agency figures, the sector

has exported ceramic products worth US\$28.75 million during fiscal 2004-05, exceeding the year's target of US\$20 million. It took many years before the exporters of ceramic wares from Bangladesh could establish the fact that the high quality of the products was capable of competing with the best in the world and carve out a market for itself.

Indeed, it takes time for any newcomer to establish its credentials and Bangladesh ceramic industry has successfully completed the hard part of the job and with some policy support from the government could further prove its true potentials. Local manufacturers claim that their quality products that include dinner, tea, cake and fruit sets are far superior to those produced in neighbouring countries. New designs and shapes are being developed in both the porcelain and bone China units to meet the demand of overseas buyers. The ceramic industry imports raw materials from China, Rumania, Indonesia and Germany and if the import duty, currently ranging from 7.5% to 15% is reduced to 5% and the gas price is reduced, they can expand very quickly.

The government provides gas to fertiliser industry at Taka two per cubic metre, Taka 3.5 to gas-based power plants and Taka 5.13 to ceramic industry. They feel that these rates should be rationalised. The ceramic industry's success is visibly laudable and such successes could not have been achieved overnight without a sustained policy support from the government. However, it is essential to develop a competitive working environment as well as a level playing field for all.

3. Furniture

According to the Census of Manufacturing Industries (2001-02), furniture sector accounts for 3.44% of establishments and contributes 1.35% of employment and 3.02% of gross value added of total manufacturing establishments employing ten and more persons. It is among the few sectors whose industry life cycle closely correlates with the macro level economic performance of the country. In essence, it means that the industry would grow at a rate higher than economic growth. Hence with the ever increasing economic growth of Bangladesh, the demand for furniture is going to increase. It is a labour-intensive as well as skill-intensive industry, where there is great opportunity to employ the unemployed population. Like other SMEs furniture sector could be a great field of employment generation for more than 10 million people. Approximately 5 million people are working currently in this sector. A large number of the unemployed can be trained to find employment in furniture making industries. The government has a role to play in this regard by establishing and running training centres exclusively designed to train the people on carpentry.

Furniture sector is facing problem due to dearth of local raw materials, which are highly import based. Furniture Manufacturing Association is highly demanding government policy changes related to duty drawbacks, import tariff on wood and processed wood, hardware and finishing materials. Thus a rational import duty structure is of paramount importance to reduce excessive burden by import duties and subsequent loss of competitiveness both in the local market and international arena. The present and proposed import duty structure by Furniture Manufacturer Association is presented below:

Present and Proposed Duty Structure of Imported Furniture Raw Materials

Serial	Particulars	HS Code	Present Duty	Proposed Duty
1	Particle Board/Melamine Laminated Particle Board	4410.90.00	CD-25% SD-15% Vat-15% Others-9.5%	CD-5% SD-00% Vat-15% Others-9.5%
2	Fiber Board>MDF (Density exceeding 0.8 g/cm ³)	4411.11.00 4411.19.00	CD-25% SD-15% Vat-15% Others-9.5%	CD-5% SD-00% Vat-15% Others-9.5%
3	Plywood	4412.00.00	CD-25% SD-15% Vat-15% Others-9.5%	CD-5% SD-00% Vat-15% Others-9.5%
4	Finished Furniture	9403.00.00	CD-25% SD-25% Vat-15% Others-9.5%	CD-25% SD-25% Vat-15% Others-9.5%
5	Furniture Fittings	9401.90.00 8205.59.00 3926.30.00 7319.30.00 7318.15.00 and all other HS code related to furniture fittings	CD-25% SD-00% Vat-15% Others-9.5%	CD-12% SD-00% Vat-15% Others-9.5%
CD= Custom Duty, SD= Supplementary Duty, Others= AIT-3%, IDSC=4%, ATV-1.5% & PSI-1%				

Source: KTALYST, 2007.

Particle board and fiber board are the two major raw materials for furniture industry. To increase the capacity of furniture industry government should reduce custom and supplementary duty on particle and fiber board. At the same time plywood demands the same measurement of duty redemption to flourish furniture industry in Bangladesh. Furniture fitting materials includes colour and all hardware related materials where supplementary duty should amount to zero. At the same time imported furniture from Malaysia, Indonesia and China is creating troubles for the local producers. To protect the furniture industry government has to impose more customs and supplementary duty on imported finished furniture from abroad.

One of the main problems for furniture industry is serious scarcity of timber. Approximately 4500 sawmills all over the country produced only 2.7 M3 of saw timber while the demand for saw timber was 5.4 M3 in 2005. Government should give more emphasis on timber import than finished furniture import, which is roughly Tk.7 billion to Tk.10 billion per year. On the other hand, Bangladesh earned Tk.149,272,000 from the export of wooden furniture in 2005-

2006 fiscal years. There is a pressing need to reduce the gap between export and import of wooden furniture.

Due to its labour intensive nature furniture industry needs more trained carpenter in this sector. Like the UCEP, German-Bangladesh Technical Centre and other non-government schools are trying to give proper training of few carpenters, which are very much inadequate to meet the huge demand for trained carpenters. Women participation at the factory level is still marginalized. Though larger manufacturers like Hatil and OTOBI employ female workers in their sales outlets, trained or at least semi-skilled women worker in furniture sector is not noticed at all.

If the furniture sector were to be declared an industry, furniture manufacturers would get special discounts on gas and electricity consumption and access to bank loans with lower interest rates. Most of the furniture manufacturers are now under the umbrella of the Bangladesh Furniture Industries Owners' Association (BAFIOA), and they are trying to get government attention to: (i)insufficient local raw materials, (ii) under invoicing of imported furniture, (iii) high duty on imported materials, (iv) little training facilities of furniture workers, and (v) lack of linkage between furniture industry and training institute (like UCEP and others).

Despite several setbacks, however, some of the enterprises, e.g. OTOBI and Hatil, are upcoming. Very recently, OTOBI has extended product line to wooden furniture. It inaugurated a wooden furniture production plant recently. The manufacturing plant has been built on 15 acres of land in Savar. The first comprehensive wooden furniture plant, with its cutting edge technology, is equipped with state-of-the-art facilities including pressurised chemical treatment and steam seasoning units.

To realize huge potential of the furniture sector, the government should: (a) declare furniture sector as industry, where they will get lower tax facilities like other industrial sectors; (b) encourage foreign and local investment in this sector by giving extra facilities; (c) take under invoicing of finished furniture export seriously; (d) lessen duty on related raw materials like ply board or particle board, colour and others; (e) encourage local panel wood (that is made of bamboo) making rather than importing it from India to use in making flood and cyclone shelters for the affected people; and (f) encourage zero duty in SAPTA.

4. Transport Equipment: Shipbuilding

Bangladesh has a rich history in the shipbuilding industry with accounts found in the writings of many travelers who visited Bengal more than two hundred years ago. It is said that the British Navy used ships built in Bengal in the famous battle of Trafalgar in 1805 where Nelson defeated Napoleon's fleet. Since the first half of the 19th century Bangladesh has been in the business of producing ships for local buyers. A country that has become known as a nation for shipbreaking, is rapidly becoming a nation of shipmaking. Now, local shipbuilders are working with about US\$ 400 million worth of orders for over 40 vessels for buyers from Germany, Denmark, Netherlands and Mozambique.

But the industry, based mainly in Chittagong, started waning in the latter part of the nineteenth century due to the use of steam engines and the discriminatory policy of British colonial rulers who were determined to protect the shipbuilding industry in the United

Kingdom, despite claims that Bengali ships were cheaper and more durable, according to Banglapedia.

Shipbuilding did not vanish, but retreated to focus on local demand and today there are about 300 small and large dockyards, generating about 230,000 jobs. Now, however, the industry is changing with companies such as Ananda and The Western Marine Shipyard again building ships following global standards. The success of these two companies has encouraged a number of companies such as Meghna Group of Industries, Rang's Group, Khan Brothers and Narayanganj Engineering & Shipbuilding to join the rally and grab the opportunities in the global shipbuilding market. Behind the resurgence of the industry is the global rise in the demand for new ships, especially smaller ones with a capacity below 15,000 dead weight tones (DWT). This has helped Bangladesh attract the attention of international shipping companies as traditional shipbuilding countries, such as Japan, China, South Korea and Vietnam, are not interested in building ships below 20,000 DWT.

There is demand for small vessels with capacity between 3,000-15,000 DWT. Bangladesh is getting orders from international shipping companies due to its cheap but skilled workers. According to industry people, the global market for small vessels is about US\$400 billion with India which happens to be the main competitor of Bangladesh.

Four ship-makers to join world's top ship-building fair

Four local ship-makers participated in the world's biggest shipbuilding fair in Hamburg for the first time ever to showcase emergence of Bangladesh as a new global manufacturing hub for small vessels. The Shipbuilding, Machinery and Marine Technology International Fair was held from 23 to 26 September 2008 in the German city, with the world's top shipbuilders, engine makers and shipping companies taking part in the biannual fair. Local ship makers had a chance to meet top shipping companies and highlight the potentials and capacity of Bangladesh in shipbuilding. The Khan Brothers has built a new dry-dock and slipways on a fifty-acre of land on the bank of the river Meghna at Munshiganj. It has invested over Tk.500 million in its new facility. The country's pioneer shipbuilder Ananda Shipyard and Slipways Limited, Chittagong-based Western Marine and Fatullah-based Highspeed also took part in the fair.

Shipbuilding is a new but booming industry in Bangladesh. Three leading ship-makers have already grabbed orders worth US\$500 million. The fair for the first time highlighted the advancement the country's new ship makers have made over the last couple of years. Bangladesh is now ready to emerge as a big shipbuilding nation.

Local Highspeed Shipbuilding and Engineering Co in Dhaka has signed an agreement with technologically advanced Japanese ship maker Tokyo Freighting Ltd to build 10 small ships. Industry insiders report that the local company's tie-up with the Japanese firm is a boost to Bangladesh's shipbuilding industry. Highspeed Shipbuilding & Engineering Co, a local shipbuilder, has won a US\$50 million order from Japan to build ten small ships, further evidence of the country's booming shipbuilding industry. This is the first time the country has won a Japanese contract and underlines the increasing global acceptance of Bangladesh as an emerging shipbuilding nation. The buyer is Japan based Tokyo Freighting Ltd, a shipping company.

Since the Japanese firm is very conscious about standards and compliance, Tokyo Freighting experts will constantly supervise the overall manufacturing of these ships. As per the agreement Tokyo Freighting Ltd will also provide technical support to Highspeed in developing its Narayanganj dockyard, in line with Japanese standards. Highspeed, which is to invest around US\$ 5 million in the coming months to upgrade the manufacturing facility of its dockyard, will supply the ships by October 2010.

The size of the ships, including dry cargo carriers and oil tankers, will vary from 2,000 MT to 4,000 MT. The Japanese company will supply all raw materials and other equipment. Japanese manufacturers are currently outsourcing small ships, as it is not cost effective now to manufacture them at huge dockyards. It is a great development for the country's shipbuilding industry as Japan, the most advanced shipbuilding nation in the world, starts shipbuilding in Bangladesh. It may inspire other advanced shipbuilding nations to come to Bangladesh.

Highspeed, already winning orders worth nearly US\$140 millions, is now capable of building vessels weighing 15,000 DWT. Four more companies such as Meghna Group of Industries, Rangs Group, state-owned Dockyard & Engineering Works Limited (DEWL) and Narayanganj Engineering & Shipbuilding have also jumped on the shipbuilding bandwagon. The four are now upgrading their dry-dock and slipways up to the international standard to grab export orders from international shipping companies.

Ananda Shipyard and Slipways has made Stella Maris – a vessel with a capacity of about 3,000 DWT, to be handed over to its Danish buyer Stella Shipping – the ship that heralds the return of Bangladesh to the global shipbuilding industry today. According to industry experts, Bangladesh, a riverine country, is getting orders from international shipping companies due to relatively cheap labour. But skilled workers, know-how and infrastructure have also helped Bangladesh gain the attention of shipping companies. According to stakeholders, thousands of Bangladeshis are now employed in shipyards in Singapore, Korea and Dubai. Some of these workers have started to return to local shipyards.

With abundant cheap labour and expertise, Bangladesh could emerge as a global small shipbuilding hub as traditional shipbuilding countries such as Japan, South Korea and China are not interested to make ships weighing under 20,000 DWT. Some 1,950 exhibitors from 55 nations have showcased their latest technology and product developments in all areas of the maritime industry at the 23rd edition of the Hamburg shipbuilding fair.

Plans to develop skilled workforce for shipbuilding industry

Western Marine Shipyard Limited, sprawling over a 15-acre of land employs over 2000 skilled and semi-skilled manpower. The company expects to employ further 10,000 people at its facilities in the near future. Western Marine Group, Bangladesh's leading shipbuilding company has signed MoUs with two government agencies to develop skilled manpower for the growing shipbuilding industry. Western Marine Group has signed the two separate MoUs with the Department of Youth Development under the Ministry of Youth and Sports and Narayanganj-based Institute of Marine Technology under the Ministry of Expatriate Welfare and Overseas Employment on 08-10-2008.

The office of the Chief Adviser in April 2008 asked for public-private partnership to launch short-term courses on shipbuilding to produce skilled workforce for the booming industry. Western Marine Group established Western Marine Institute in July 2008 after getting approval from the Technical Education Board. Under the MoUs, Western Marine Institute will offer course on 'Welding and Fabrication' jointly with Chittagong based Youth Development Training Centre and Narayanganj based Institute of Marine Technology. Spoken English course will also be provided to the students to hone their language skill. After receiving training, participants will acquire necessary skills to find jobs in shipbuilding sector at home and abroad. Knowledge on welding and fabrication is a basic prerequisite for shipbuilding. 11 welders/fitters, who received training from the Western Marine Institute, have already been selected for working in a Dubai based shipyard.

However the sector has to depend on importing almost all the raw materials, ranging from engines to electronics and sanitary items such as toilets and washbasins. Nevertheless, local value addition is about 30-35% due to having skilled manpower. The value addition will grow much if Bangladesh can develop backward linkage in sectors such as electric cables and sanitary items.

Experts, referring to the present 3-5% annual growth in global shipping tonnage, reported that the demand for vessels, especially smaller ones, would remain for the next eight years and Bangladesh can seize the opportunity if the government takes a pragmatic look at the issue. There is no policy for the shipbuilding sector. But a pragmatic policy is urgently needed for allowing the industry to grow systematically and steadily. It is estimated that it would be a multi-billion dollar industry in coming days and export orders will reach the US\$ 1 billion mark by 2011.

Making its inroad in global shipbuilding market in February 2008, the Western Marine has already received orders for building 18 ocean-going ships. Of these, five have been received from Denmark, twelve from Holland and one from Singapore. The country will earn foreign currency worth US\$ 180 million from the completion of the ships, informed the Western Marine officials.

Questionnaire for the Labour and Skills Survey

Current Need and Future Demand for Skilled and Educated Workforce of the Industrial Sub-Sectors in Bangladesh

**Bangladesh Institute of Development Studies
E-17 Agargaon, Dhaka-1207**

Name of the Interviewer:

Date of Interview:

PART A: INTERVIEW WITH SENIOR MANAGEMENT:

Section 1: Basic Information about the Enterprise

1. Name and Address of the Enterprise with Contact Numbers:
2. Name of the Interviewee with Designation:
3. Year of Commissioning of the Enterprise:
4. Name of the Sub-Sector:
5. Name of the Major Products of the Enterprise and the labour costs.

Name of Top 5 Products by Volume of Production	For Domestic Markets	For Export Markets	Elements of Cost of Production (Tk.)	
			Cost to Produce One Unit	Share of the labour Cost for that Unit (%)
1.				
2.				

3.				
4.				
5.				
Average for all products				%

Table 1: Share of labour cost in the cost of production

Section 2: General Data on the Company Current Workforce

6. Total number of company current employees (permanent and contract) _____
7. Total number of senior engineering, managerial and other professional staff

8. Total clerks _____
9. Total number of skilled workers (all skill categories including apprentices acquiring skills) _____
10. Total number of unskilled workers (helpers, etc.) _____
11. List of production workshops to be interviewed in detail

Section 3: Skills Development Practices of the Enterprise/Company

12. Does your company provide any structured training to **new workers and employees**? (Yes/No)
13. If it does, what kind of training is provided?

14. Common duration of in-company training for **new** workers and employees, if any: (in days/weeks/months) _____
15. Who commonly trains the new workers/employees?

16. If structured training is not provided in company, do you send **new** workers/employees for training outside the company?
17. If training for new workers/employees is provided outside, what is its duration?

18. Does your company provide **retraining or skills upgrading** for employees? If it does, which categories of employees are covered by such training?

19. How can you measure the volume of training annually provided by your company (on-the- job and off-the-job) (in training days, numbers of trainees, % of payroll spent, etc.?)

Type	Number of Trainees	Number of Training Days	% of Payroll Spent
On-the-Job Training			
Off-the-Job Training			

20. If your company mostly employs unskilled people and train them 'On-the-Job', how long does it take on average to train:

- a highly-skilled worker _____

- a skilled worker _____

- a semi-skilled worker _____

Section 4: Apprenticeship in the Enterprise/Company

21. Does your company have apprentices? _____

22. What is the definition of an apprentice in your company? (in terms of employment status/contract, pay, etc.)

23. What are the major apprenticeable trades in your company (occupations in which you have apprentices)?

24. What is common duration of apprenticeship for different categories of workers/employees? _____

25. What is the skill level of the company apprentice upon finishing his/her term of training? _____

26. How many apprentices do you have on the annual basis in different categories of jobs? _____

Section 5: Current Qualification Profile of Professional/Para-Professional Workforce

Occupations	Total Number of Staff	With Degree / Higher Degree (%)	With Diploma/Advanced Diploma (%)	With Certificate (%)	Commenced but not Completed Study (%)	No formal qualifications (%)
Managerial						
Engineering and other professionals						
Secretarial / clerical						
Supervisory						

Table 2: Professional/Para-Professional Qualification Profile

Section 6: Current Qualification Profile of Workers in the company

Occupation	Total Number of Workers in each occupation	With Diploma/Advanced Diploma (%)	With Certificate (%)	No formal qualifications (%)
Eg: welder				

Table 3: Qualification Profile of workers in the company

Section 7: Opinions on formally-trained TVET graduates

27. Does your company employ graduates of the formal TVET system? (Yes/No)

28. Would you prefer to recruit formal TVET graduates as compared to other untrained youth? (Yes/No)
29. In your company, are TVET graduates generally doing better than other entry-level workforce and in what sense? (Yes/No)
30. If “Yes” why? _____ (are they more productive, faster learners, more accurate, etc.).
- If “No”, why not? _____

Section 8: Supply of formally-trained workers (skilled or semi-skilled) for your industry

31. Do you think there is an **adequate supply** of formally-trained workers for your industry?:
- From public providers _____ **Yes/No**
- From private providers _____ **Yes/No**
- If not**, why not?
- _____
32. Do you think the **quality** of formally- trained workers is adequate for your industry?:
- From public providers _____ **Yes/No**
- From private providers _____ **Yes/No**
- If not**, why not?
- _____
33. Do you think the formally trained workers have **relevant** skills for your industry?:
- From public providers _____ **Yes/No**
- From private providers _____ **Yes/No**
- If not**, why not?
- _____

Section 9: Supply of Diploma level graduates

34. Do you think there is an **adequate supply** of Diploma level graduates for your industry?:
- From public providers _____ **Yes/No**
- From private providers _____ **Yes/No**
- If not**, why not?
- _____
35. Do you think the **quality** of Diploma level graduates is adequate for your industry?:
- From public providers _____ **Yes/No**
- From private providers _____ **Yes/No**

If not, why not?

36. Do you think the Diploma level graduates have **relevant** skills for your industry:
From public providers _____ **Yes/No**
From private providers _____ **Yes/No**
If not, why not?
-

37. What do you think are the potential areas for improving the supply of the skilled and educated TVET graduates for your industry?
-

PART B: GROUP DISCUSSION WITH MANAGEMENT

(Discussion with 5-7 staff on the definitions of worker skill levels including general manager, HRD manager, shop-floor supervisors)

Section 10: Definition of Skill Levels in the Company

38. Do you distinguish between skills levels of shop-floor workers? (Yes/No)
-

39. If you do, what categories of workers with different levels of skills do you use?
(e.g., highly-skilled, skilled, semi-skilled)
-
-

40. Do you see any advantages of distinguishing between skills levels of workers?
Yes/No.

41. If Yes, what are the advantages for the company?
-

42. What are the advantages for workers themselves?
-

43. Are there any disadvantages for distinguishing between the skills levels? _____

44. How do you define levels of the worker skills in your company/industry?
-
-
-

Possible basis for definitions:

- months or years of on-the-job training
- formal certificate acquired in a TVET institution
- number of years of practical work in a company,
- through the assessment of tasks that workers can accomplish
- other approaches (specify)

45. Do you pay highly-skilled workers generally more than the skilled workers?
(Yes/No)

46. If yes, by how much (____%);

47. Do skilled workers usually receive higher pay than the semi-skilled workers
(Yes/No)

48. If yes, by how much (____%)?

49. Do you practically do anything in order to identify, record and reward the different
skills levels of workers? (Yes/No)

50. If yes, what do you do?

PART C: SHOPFLOOR INTERVIEWS

(Interviews with shopfloor managers in each major workshop)

Section 11: Current occupational and qualification structures of workers on the shopfloor

51. How many workers do you currently employ in your
workshop?_____

52. What are the occupations of skilled workers in your workshop and how many
workers are there in each occupation
(complete Table 4)

53. How many unskilled workers (excluding apprentices acquiring skills) do you have
in your workshop?

55. Do you have any vacancies in skilled occupations? (complete column (e) in Table 4)

[illegible]

-
-
-
-

-

58. Do you think that some workers do not have the skills/knowledge and behaviours required to implement their skilled jobs?
(Yes/No) _____
59. If “Yes”, refer to the list of skilled occupations in Table 4 and note the skills gaps for each occupation in Table 5 below.

(For example: Let’s talk about your carpenters: Do you think that your high-skilled and skilled carpenters require additional skills to implement their jobs? Now let’s talk about Furniture Assemblers, etc., etc.)

	Occupations (from Table 4)	Description of Skills gaps (lacking skills, knowledge, behaviours)	Interviewer’s comments
1	E.g: Carpenter	Accuracy, precision, manual dexterity, knowledge of machine maintenance, etc.	
2			
3			
4			
5			
6			
7			

Table 5: Skills Gaps of shopfloor workers

Section 13: Assessment of the Demand for Skilled and Educated Workforce on the shopfloor

60. How many skilled workers on average quit your workshop each year because of natural reasons- retirements, sickness, death, migration, other reasons?

61. Do you expect any expansion of the production capacity resulting in the demand for more skilled workers? (Yes/No) _____
62. Are you going to introduce new production processes/technologies/products requiring new and better skilled workers?
(Yes/No) _____
63. Do you target improvements of quality or productivity requiring new and better skills? (Yes/No) _____
64. Will any other important changes requiring employment of more skilled workers be initiated? (Yes/No) _____

65. If yes, what are those changes likely to be?

66. If “Yes” was the response to any of the above questions (58-61), how you are going to replenish/improve the stock of skilled workers? :

a. Find experienced /skilled workers in the Labour market

b. Rely on fresh graduates from TVET institutions

c. Employ unskilled youth and train them in company

d. Retrain and upgrade existing company workers to provide new skills

e. Employ skilled migrants

f. Combinations of the above

67. Please explain relative importance/unimportance of each of the above streams for your company:

a. Find experienced /skilled workers in the Labour market

b. Rely on fresh graduates from TVET institutions

c. Employ unskilled youth and train them in company

d. Retrain and upgrade existing company workers to provide new skills

e. Employ skilled migrants _____

f. Combinations of the above _____

68. In which occupations/trades and skills levels do you expect demand for workers to considerably increase over the next 2-3 years?

69. You previously indicated that you have vacancies in some skilled worker jobs (quoting from Table 4). What were, in your view, the major reasons for skilled workers to quit these jobs?

70. Has it been difficult to find skilled workers to fill these vacancies?

_____ **Yes/No**

71. What current shortages of highly-skilled and skilled workers in your workshop cause major constraints?

THANK YOU